

THE MEDICAL JOURNAL OF AUSTRALIA



VOL. II.—14TH YEAR.

SYDNEY: SATURDAY, JULY 30, 1927.

No. 5

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PYELITIS IN CHILDREN.¹

By EDGAR H. M. STEPHEN, M.B., Ch.M. (Sydney),
Honorary Physician, Royal Alexandra Hospital
for Children, Camperdown, Sydney.

A SIMPLE bacilluria may exist without any cells appearing in the urine.

Nephritis may exist in association with the pyelitis. If such is the case, renal cells and casts are found in the deposit and there will be the further evidence of the existence of nephritis as there will be interference with the secretion of urea.

If the pyelitis is associated with cystitis, the urine will be foul and alkaline in reaction. Bladder cells will be found pear-shaped in type and derived from the deeper layers of the bladder epithelium. Such cells indicate a vesical catarrh.

The causal agent of pyelitis is usually the *Bacillus coli communis* and this term *Bacillus coli communis* is used to cover several species other than the *Bacillus coli communis* proper, such as the lactose fermenters, the *Bacillus cloacæ* and the *Bacillus lactis aerogenes* and the non-lactose fermenters *Bacillus typhosus*, *Bacillus proteus*, Gärtner's bacillus and Morgan's bacillus.

Occasionally at the Royal Alexandra Hospital for Children species are found not identifiable with any of these by ordinary tests.

These points indicate how essential it is that a vaccine for use in the treatment of pyelitis should be autogenous.

Occasionally secondary sepsis occurs and infection with *Staphylococcus albus* (usually a large species), *Staphylococcus aureus* or even streptococcus occurs.

The tubercle bacillus should always be sought for.

It is not known definitely how infection of the renal pelvis occurs, whether it is conveyed by the blood or by an ascending infection. As the proportion of females to males affected with pyelitis is two to one, it seems reasonable to suppose that infection is from the bowel and that the greater accessibility of the female urethra explains the disproportion. A temporary block of either ureter may explain the absence of pathological proof at various times in the course of this disease. Leucocytosis of 16,000 to 32,000 may be found.

In regard to sex one hundred and eleven of the one hundred and forty-eight patients recorded in the discharges from the hospital in the last two and a half years were females.

As pyelitis is a frequent complication of gastro-enteritis and pink disease, I think the total number of cases far exceeds one hundred and forty-eight. Six deaths occurred. The age varied from infancy onward.

The patients with pyelitis admitted to hospital during the months from January to June this year were all suffering from an acute form save two. One died in four days, the others were discharged in two to four weeks. All gave a definite history

of gross changes in the urine and symptoms of derangement. The urine was opalescent or turbid and foul. The reaction was acid. The deposit gave a reaction with *liquor potassæ* and a culture report of a Gram-negative bacillus, probably *Bacillus coli communis* was obtained.

The duration of pyrexia varied from eight to sixteen days. With two exceptions the patients were discharged free from symptoms and on a fair way to recovery.

The prognosis in acute pyelitis is good.

It is in chronic pyelitis that the physician gets an opportunity of converting an anæmic, peevish child into the ray of sunshine that she is intended to be in her home.

The child with a bacilluria pure and simple often has a long course of ill-health before her disease is recognized with the aid of the pathologist. Her subjective symptoms are usually as pronounced as those of a patient with the more obvious pyelitis, with opalescent or turbid urine with definitely foul odour.

Frequency and irritation on micturition at intervals of days or weeks with malaise, anorexia and pyrexia are the symptoms of both classes. Attacks of vomiting may also occur and a diagnosis of cyclic vomiting or acidosis is sometimes made.

Treatment with alkalis for a prolonged period is usually crowned with success. The dose of alkali required to render the urine alkaline often equals that required for adults. Short periods of cessation of alkalis and substitution of hexamin with acid sodium phosphate is advised. In my experience a recurrence of symptoms often follows this change and I feel encouraged to persist with an uninterrupted course of alkalis.

Infants of twelve months frequently require and tolerate well sodium bicarbonate two grammes (grains thirty) and potassium or sodium citrate two grammes three or four times a day. The use of vaccine has often proved invaluable in the treatment of chronic pyelitis in children, but has usually to be continued for some weeks.

When a history of definite pyelitis for long periods such as six months is obtained, I consider the patient should be referred to a urologist. The success of lavage of the renal pelvis in obstinate cases has filled me with gratitude and admiration. A mild degree of nephritis usually clears *pari passu* with the subsidence of pyelitis.

I am very conscious of the necessity for X ray examination to exclude the presence of calculus and from several convincing demonstrations by Dr. Tidswell I bear in mind now that abnormalities of the urinary tract are no uncommon event and serve to explain the appearance in the mortuary of some of our patients diagnosed *ante mortem* as suffering from pyelitis or pyelo-nephrosis.

In order to insure respectful regard for the abbreviated pathological account with which I have prefaced this effort, I must tell you that Dr. Tidswell was the inspired source from which it was derived.

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on June 23, 1927.

PYELITIS COMPLICATING PREGNANCY.¹

By F. BROWN CRAIG, M.B., Ch.M. (Sydney),
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Sydney.

As a cause of fever, malaise and pain during pregnancy and the puerperium pyelitis is a disease of the first importance. This infection of the urinary tract involves not only the pelvis of the kidney but the kidney itself, in addition to the ureter particularly in its upper part. The lesion then is a more extensive one than the familiar name implies.

The basis of this paper is an analysis of fifty cases of pyuria complicating pregnancy or the puerperium taken from the case records of the Royal Hospital for Women. In this series there were twenty-four patients with mild infections whose temperature did not at any time of the illness exceed 37.8° C. (100° F.). In twenty-six infections classed as severe the temperature rose above 37.8° C. It is my object to deal with the clinical features of pyelitis from the obstetrician's point of view.

The disease is commonest in young *primigravidae*. In the series there were twenty-six between fifteen and twenty-five years, nineteen between twenty-five and thirty-five years and five over thirty-five years of age.

The age I think is a mere circumstance depending upon the average age at which the first gestation occurs. The onset of the disease is most commonly associated with the first pregnancy. Of my patients twenty-one were *primigravidae*, four in the second pregnancy, seven in the third, three in the fourth, four in the fifth, two in the sixth and one each in the seventh, eighth, ninth and tenth.

The commonest period for acute symptoms to arise is between the twentieth and twenty-eighth weeks. This is the time when the uterus is becoming a considerable abdominal tumour and begins to exercise increasing pressure upon the structures in the lower part of the abdomen.

Although in some instances these histories did not indicate the course of the pregnancy to its termination, the evidence goes to show that if the pregnancy can be carried over the acute stage of the disease, there is a fair probability that it will continue to term in spite of persistent bacilluria.

In a few cases pyelitis does not occur till the puerperium. The symptoms may clear up only to reappear in the same pregnancy. It may recur in subsequent pregnancies. In one of my series there had been four previous attacks, in two cases one previous attack, while in the rest there had been no previous affection of the kidney. In twenty-eight patients the right side only was affected, in nine the left only, whilst both were involved in thirteen instances.

The common involvement of the right side can be explained by the fact that the uterus normally

undergoes a certain amount of twisting to the right as it enlarges and thus comes to lie over the course of the right ureter where it enters the pelvis.

The anatomical position of the left ureter close to the sacral promontory renders it more protected from pressure than the right.

Butler⁽¹⁾ and also Kretschmer, of Chicago, have demonstrated by pyelograms that a large percentage of dilated renal pelvis and ureters are found in pregnant women who have no symptoms and whose urine is normal. The cause of the morbid process then does not entirely depend upon back pressure, but infection must occur in addition. The infecting organism is almost always *Bacillus coli communis*. This organism was obtained in pure culture in the urine of twenty-seven of my patients. Very rarely staphylococci, streptococci or gonococci are found to be the infecting agents. Clinical evidence points to the probability of infection reaching the kidney by way of the blood stream. The subjects of this malady are generally constipated or else there has been some enteritis immediately before the onset of the acute symptoms. Under such conditions the damaged intestinal mucosa does not offer the normal resistance to the emigration into the blood stream of *Bacillus coli communis* whose virulence has been increased by morbid conditions in the bowel.

Bawtree⁽²⁾ has demonstrated by serological reactions that there is a similarity between the organism obtained from the urine and faeces of a sufficient number of patients suffering from pyelitis to bear evidence in favour of the infection by way of the blood stream. Thirteen out of the twenty-three female patients whose histories he investigated, were either pregnant or had very recently been confined. If the healthy resistance of the renal tissues is impaired by the damming back of urine from pressure upon or kinking of the ureter, then conditions are favourable to the onset of inflammation in the area of lowered resistance.

Its severity will depend upon the virulence of the organism and the completeness of the obstruction.

Pyelitis as a complication of pregnancy is seldom fatal to the mother. In my series there was one death.

This woman who was twenty-one years of age was twenty-seven weeks pregnant. She had had an early abortion six weeks after her marriage twelve months previously. The onset of her illness had been sudden five weeks before her admission. There had been pain in the right loin from the beginning. Three days after the onset hæmaturia had set in. On admission she had a temperature 38.3° C. (101° F.) and a pulse rate of 128. Her right kidney was enlarged and tender. In addition her liver edge was 3.75 centimetres (one and a half inches) below her costal margin. Her urine contained pus; *Bacillus coli communis* was obtained in pure culture. Her temperature remained high till her tenth day in hospital when it subsided. On the twelfth day the liver margin was normal, but she continued to vomit. On the eighteenth day there was profuse epistaxis. On the twenty-first day the vomiting became more active and acetone was present in the urine. She was restless and developed air hunger. In appearance she was worn and tired. The next day she was delirious, her temperature being 37.2° C. (99° F.) and her pulse became irregular and small. She came into labour and was delivered by forceps of a still-born infant. Her condition became steadily worse and four hours later she died.

¹Read at a meeting of the New South Wales Branch of the British Medical Association on June 23, 1927.

The clinical picture here is rather one of toxæmia of pregnancy developing on top of a pregnancy pyelitis. Had her pregnancy been terminated at an earlier period, in all probability her life would have been saved.

It is not uncommon for patients with pyelitis to develop signs of preeclamptic toxæmia. In eight patients of my series this happened.

As a rule in mild infections the condition will clear up very satisfactorily under medical treatment. In the severe type of infection induction may become necessary. In eight patients of my series the uterus had to be emptied on account of the increasing toxæmia of the mother.

For the fœtus the outlook is not so good. Apart from deliberate induction, spontaneous miscarriage or premature labour is very liable to occur in severe types of pyelitis at the height of the attack on account of the pyrexia and the profound toxæmia of the mother. This occurred in seven patients of the series in all of whom the infection was of the severe type.

Although the symptoms may disappear under treatment, it is not uncommon for the organisms to persist in the urine for months afterwards.

In rare instances the obstruction of the ureter may become permanent, leading to pyonephrosis or the formation of a perinephritic abscess. Even general peritonitis from rupture of such an abscess has been reported. Effusion into the pleural cavity adjacent to the affected kidney is not uncommon with later possibly an empyema due to spread of the *Bacillus coli communis* infection.

In discussing the diagnosis the most constant feature of these cases is pyuria. In mild infections there may be very little rise of temperature, but in severe forms there is definite pyrexia often accompanied by rigors, vomiting and backache. In both types palpation reveals tenderness in the costo-vertebral angle on the affected side and abdominal resistance amounting in the most acute forms to definite rigidity which may suggest an intra-peritoneal lesion. A pelvic examination at this stage will often reveal distinct tenderness over the lower end of the thickened ureter where it crosses the vaginal vault.

The urine at first is diminished in quantity and of high specific gravity. It is acid in reaction almost always. *Bacillus coli* in pure culture is usually found, but pus may not appear immediately because of the obstruction of the ureter. As well as pus cells, blood and epithelial cells are to be found. If pus is copious in the urine, it means good drainage and therefore is a favourable sign. The temperature oscillates for several days, but then subsides as a result of treatment and better drainage when the swelling of the ureter lessens.

Confusion may occur in the differentiation of pyelitis from appendicitis, influenza, acute pleurisy and pneumonia, especially when the pleurisy is diaphragmatic. Acute cystitis and renal calculus may be mistaken for pyelitis.

In the puerperium, before a diagnosis of uterine sepsis is made, pyelitis must always be excluded

by a microscopical examination of the urine.

Treatment is a simple matter in the majority of cases. It consists of rest in bed, diet limited to copious draughts of water only for the first twenty-four hours, then tea, coffee, milk and milk foods until the temperature subsides when fish and white meats are added. The bowels should be cleared at the onset by a copious soap and water enema and a simple purgative.

The alkalis potassium citrate and bicarbonate in doses of two and a half to four grammes (forty to sixty grains) should be given at intervals of four hours and pushed until the reaction of the urine becomes alkaline. These drugs have proved their usefulness. Alkaline urine seems to be less irritating and also the alkalinity inhibits the growth of the colon bacillus. I have a bad impression of the effect of the hexamin group of drugs. Local irritation of the kidney and gastric disturbance always seem to follow their exhibition, at any rate during the acute stage of the illness.

As the intestinal tract seems to be the source of the infecting organism, a fractional dose of calomel, 1.0 to 1.5 milligrammes (one-sixth to one-quarter of a grain), may be given every night followed by a saline aperient in the morning. After the acute stage has passed, the calomel is given three times a week.

If pregnancy is not too far advanced to render it distressing, the patient should be directed to lie on her face for ten to twenty minutes every few hours. This posture will often result in the sudden appearance of copious pus when before it was scanty. Evidently an altered position of the pelvic viscera relieves the constriction of the affected ureter which may be due to the enlarged uterus or a kink from the stretching of the broad ligament.

It is my practice to have an autogenous vaccine prepared from the first catheter specimen in these cases. Usually at the end of a week or ten days the temperature has returned to normal. When this point has been reached the vaccine is started. The reaction is judged by the rise of temperature, this being a guide to the increase of dosage. Fifty million *Bacillus coli communis* organisms is a fair initial dose, the intervals between doses being three days at first and later extended to seven days. The vaccine is continued for the rest of the pregnancy at increasing intervals.

In my series forty-five patients were treated conservatively. Two had been delivered before admission. Of the remaining forty-three six had to submit to induction of labour and eight came into labour spontaneously.

The remaining five patients, one with a mild and four with severe infections, were treated by ureteral catheterization, three successfully and two followed by induction of labour. One patient had been treated by ureteral catheterization at another hospital followed by a severe reaction. On admission she was treated by the conservative methods I have indicated and recovered.

Treatment by ureteral catheterization and lavage of the kidney pelvis in my opinion should be reserved for patients whose infections prove

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resistant to conservative methods. I have found patients extremely reluctant to submit themselves to this method of treatment. The use of the catheter is indicated when there is a permanent stricture of the ureter or a kink which prevents satisfactory drainage.

There are considerable technical difficulties in carrying out this treatment owing to the oedematous condition of the bladder wall during pregnancy and the distortion of the bladder from pressure of the enlarging uterus. To demonstrate abnormalities of the ureter it is necessary to have access to an X ray apparatus which unfortunately is not always available.

The treatment by ureteral catheterization and lavage of the kidney pelvis is not without its dangers as the following history will show. This case occurred in the practice of my colleague, Dr. Constance D'Arcy, who has kindly allowed me to publish it.

On admission the patient, aged nineteen years, was in the twenty-fourth week of her second pregnancy. She had suffered from vaginal discharge, scalding and frequent micturition since the beginning of her present pregnancy.

She had been treated at another Hospital for six weeks before her admission to the Royal Hospital. In the former institution she had received complete urological treatment. It was then found that the bladder urine was full of pus, the kidney specimens of urine being quite clear. After this examination she had a severe reaction. She continued to be very seriously ill for the next three weeks when she left the institution at her own risk. She was admitted three weeks later to the Royal Hospital for Women. Instead of the symptoms being confined to her bladder, both kidneys had become acutely affected and on her admission her condition was really desperate. She looked pale and acutely ill, her temperature was 38.9° C. (102° F.) and her pulse rate was 120. The slightest movement caused acute abdominal pain. An attempt to palpate the kidneys through her distended abdomen caused the patient agonizing pain. *Per vaginam* the bladder was so tender as to preclude any further examination. The pathological report showed the urine to be teeming with pus cells and intracellular Gram-negative diplococci were plentiful.

Further local treatment could be carried out only when the patient was anesthetized. By bladder irrigation, topical applications to the cervix under anesthesia, the exhibition of vaccine and copious sedatives the patient was carried on to the thirty-sixth week of pregnancy. All this time she made a steady improvement. She then gave birth prematurely to a living infant of about 1.8 kilograms (four pounds) who survived.

I quote this case to emphasize the fact that ureteral catheterization should never be attempted when the infection is limited to the bladder.

The point of view of the obstetrician is essentially different from that of the urologist when dealing with the subject of pyelitis complicating pregnancy. The obstetrician is mainly concerned with the fact of pregnancy and meets the complication as an unfavourable incident in its course. The urologist on the other hand concentrates his attention upon the infection of the urinary tract and certain abnormal mechanical disabilities of the ureter which can be demonstrated by the special methods of examination at which he is expert.

The obstetrician often to his sorrow lacks the facility of technique and the elaborate apparatus necessary to produce a pyelogram and has of necessity to confine himself to simpler clinical methods of

investigation and more conservative means of treatment. In spite of these limitations my figures show that at least 70% of patients will recover and continue on to term. In the remainder it is necessary to call in the urologist with his complete armamentarium to avoid the necessity of prematurely ending the pregnancy in order to save the mother's life.

In conclusion I would like to emphasize the fact that the earlier a urinary infection complicating pregnancy is recognized by antenatal supervision, the better chance there is of preventing the development of pyelonephritis.

Acknowledgments.

My thanks are due to Dr. W. E. Fisher, of the Royal Hospital for Women, for his help in collecting and classifying the material for this paper and to my colleagues on the Honorary Staff for the use of their case records.

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- ¹ P. F. Butler: "Pyelitis in Pregnancy," *American Journal of Roentgenology*, Volume XV, February, 1926, No. 2, page 144.
- ² Frank Bawtree: "On Bacillus Coli Infections of the Urinary Tract with Special Reference to the Presence of Similar Organisms in the Fetus," *Journal of Obstetrics and Gynecology of the British Empire*, Volume XXX, Number 4, Winter Number, page 578.

PYELITIS.¹

By R. K. LEE BROWN, M.D.,

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PYELITIS strictly considered is an inflammation of the mucous membrane of the pelvis and calyces of the kidney and is frequently associated with ureteritis and cystitis. It is not strictly to be distinguished from pyelonephritis which means an infection both of pelvis and parenchyma. Whether such a purely localized condition as inflammation of the mucous membrane of the pelvis alone can occur is doubtful. In reality all infections of the kidney from the simplest to the gravest represent different stages of the same condition.

Renal infections are always secondary, though the primary focus may not always be demonstrable. The infecting organism at the onset is generally a streptococcus arising from some primary focus situated in the teeth, tonsils, nose, pharynx or from some intestinal focus such as appendix or through the mucosal erosions of colitis. The streptococcus, after the acute stage has passed off, is replaced by the more hardy *Bacillus coli*.

Pyelitis with the exception of cases due to chemical irritants is always due to bacteria which in most cases reach the kidney through the blood stream.

Infection may reach the kidney in the following ways:

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on June 23, 1927.

1. Organisms may be carried directly to the kidney pelvis by means of a ureteral catheter.

2. Organisms may and generally do reach the kidney through the blood stream. However, the possibility of organisms brought to the kidney by the hæmatogenous route passing through without causing any lesion must be considered. For instance in pulmonary tuberculosis, typhoid fever and pneumonia, organisms are frequently found in the urine without apparently causing any lesion of the kidney. Grawitz did some interesting work along this line by demonstrating that mould spores appeared in the urine after intravenous injection.

3. Some lymphatic channels from the intestine enter the same retroperitoneal lumbar lymphatic glands as do some of the channels from the kidney. Infection by this path might be possible but has never been proved.

4. Since the secretory stream carries the products of inflammation to parts at a distance, descending infections are the rule. Any site below the lesion may be affected, local predisposition playing a part. For instance in pyelitis the trigone and posterior part of the urethra may be affected, while the fundus of the bladder is normal. A number of observers contend that pyelitis is always preceded by a lesion of the parenchyma.

5. Controversy has raged for ages over the mechanism of ascending infection. Infection may spread in a direction opposed to the secretory stream in three ways: (a) by the lumen, (b) by the lymphatics, (c) by the blood stream.

Infection by way of the lumen cannot occur unless there is reverse peristalsis, obstruction of the flow or unless there is an increase of pressure below which forces the contents back passively, that is reflux. Reverse peristalsis has not been observed in man, but has been observed in a rabbit above an obstruction. Young and Sampson, working on normal type of ureters in human cadavers, found that reflux could not occur unless there was definite inflammation of the bladder and ureters. If the ureteral walls become inflamed and rigid then reflux can be produced, but this could not occur in the living without obstruction. Graves and Davidoff have recently described the production of reflux in the living rabbit at a pressure of about fifteen millimetres of mercury if the muscular tone of the bladder is good. We have tried to repeat this experiment, but as yet have not been able to reproduce it. Reflux will occur if a cystogram be taken after ureteral catheters have been left *in situ* for some time and then withdrawn just before the cystogram is taken.

In regard to infection by way of the lymphatics Sweet and Stewart have done some interesting experiments. They showed that if the outside of the ureter were exposed to infection without opening into the lumen, diffuse infection of the kidney resulted with little or no infection of the ureteral mucosa. When a piece of rubber tubing was substituted for the middle portion of the ureter, thereby interrupting the lymphatic channels but not the lumen, infection did not ascend to the kidney. According to these authors ascending infection of the

kidney does not occur unless the bladder wall itself is invaded in the neighbourhood of the ureteral orifices.

In regard to infection by way of the blood stream an infection of the lower tract can reach the upper tract only through the general circulation. Although there are anastomoses between the blood vessels of the various urogenital systems, the currents do not ascend. There are blood channels all the way from the bladder to the kidney, but the flow is in the opposite direction. No blood passes directly from the bladder to the kidney except through the *vena cava* first and thence to the kidney by way of the renal artery.

Bacteriology.

The bacteriology of pyelitis is a subject of extreme complexity. The bacilli of the colon group are the most frequent invaders of the urinary tract. These organisms generally occur in acid urine, chiefly because the normal reaction of the urine is acid. Typhoid bacilli seem able to penetrate through the kidney without causing any definite renal lesion. Gram-positive cocci come second to the colon group in point of frequency. The cocci are more inclined to cause pyelonephritis and tend to occur in acute cases, frequently being replaced by colon bacilli as the condition becomes chronic. Gonococcal pyelitis has been described, tubercle bacilli, *Bacillus pyocyaneus*, *Bacillus proteus et cetera* are fairly common. In fact the organisms which may be found in the urine are legion. Sometimes the urine is opalescent with bacteria and yet there will be no growth on ordinary culture media. I have had a patient whose urine was microscopically loaded with rods, and yet in spite of various media employed the report invariably came back "no growth on culture."

Ætiology.

In chronic cases the colon bacillus is usually found in pure culture, but in the more acute cases streptococci or staphylococci are more frequent. When the primary lesion is due to streptococci or typhoid bacilli, these generally give place to colon bacilli as the condition becomes chronic. *Bacillus coli* may be found in acid or neutral urine and does not exhibit such tendency to form cortical abscesses or to extend into the perirenal tissues as do the cocci. Pyogenic cocci tend to decompose urea into ammonia and water, thereby rendering the urine alkaline. They are inclined to cause cortical lesions and are generally found in perinephritic abscesses.

Bumpus and Meisser, of the Mayo Clinic, did some illuminating work on the bacteriology of pyelitis and pyelonephritis. They injected a large series of rabbits, eighty-two, with streptococci obtained from foci in the teeth and blood of patients suffering from pyelonephritis and in sixty-three animals of the series they were able to produce lesions of the kidneys. They believe that this is definite evidence that pyelonephritis originates from focal infections harbouring streptococci which have a selective affinity for the urinary tract. They also showed that the colon bacillus which is so commonly found in lesions of this type, is really a secondary

invader. Colon bacilli replace streptococci in the kidney very much in the same way as the gonococcus is replaced in the urethra by the more hardy pyogenic organisms. Further interesting work dealing with the specificity of organisms was done by Rosenow and Meisser. They took a series of dogs and infected the pulp cavity of their teeth with a strain of streptococci obtained from the teeth of a man with nephrolithiasis, while another series of dogs was infected in the same way with streptococci obtained from the teeth of a patient suffering from arthritis. The latter served as controls for the first series. All the dogs in the first group developed renal calculi in from eleven to one hundred and twenty-three days while no renal lesion was produced in any dog belonging to the second series.

Pathology.

It has been customary to divide the lesions occurring in infections of the kidney into pyelitis and pyelonephritis. These conditions are arbitrary and they are to be considered as in no way separate diseases.

Pyelitis was originally supposed to be an infection confined to the renal pelvis and to have been of ascending origin by way of the ureter. Pyelonephritis, multiple abscesses *et cetera* were supposed to have been of hæmatogenous origin and confined to the parenchyma. This distinction is no longer valid, as it is now known that practically all kidney infections arrive by way of the blood stream. It is apparent that the kidney is frequently able to eliminate bacteria in large numbers without serious or obvious renal injury, as is often seen in enteric fever, while at other times serious lesions are set up. It is apparent that here as elsewhere the result is due to a balance between the virulence of the organisms and the immune reactions of the body both local and general. It is generally believed that all lesions of the pelvis are derived from primary lesions of the parenchyma which may rapidly heal.

Any form of urinary obstruction or the presence of stone or foreign body predisposes to infection of the kidney. Obstruction complicates infection greatly and adds to its seriousness. This may be a result of urinary stasis or a lowering of the local resistance through back pressure.

Symptoms.

Owing to the variation in intensity there is a correspondingly great variation of symptoms. These may be general, due to the absorption of toxins or to the failure in elimination of waste products. They may be localized to the kidney or they may be manifested by bladder symptoms only.

Fever is generally present in acute cases and may or may not be present in chronic cases. The temperature chart will depend on the acuteness and extent of the lesion. If there is extensive involvement of the parenchyma, there may be a very hectic chart with remarkably little disturbance in the urinary findings. On the other hand there may occur an afebrile type of pyelitis with a urine

loaded with pus and organisms. The development of bladder symptoms is the rule and in many cases cystitis so dominates the field that it is the only symptom of which the patient complains. Pain in the kidney may not be present in very acute cases, but is generally evident as a localized nephralgia. Symptoms of acute renal infection may be listed as pain, fever, pyuria, hæmaturia, polyuria and frequency, general toxæmia.

Diagnosis.

The diagnosis of pyelitis rests on a careful urinary examination and finally on ureteral catheterization and separate studies of specimens of urine from the individual kidney. In acute cases which are really pyelonephritic ones, the urine will contain albumin, red blood corpuscles, pus cells and the organisms causing the condition. In chronic stages the albumin will be greatly lessened and the red blood cells probably absent. Pyuria of renal origin is frequently associated with a moderate cloud of serum albumin, whereas pyuria originating from the lower tract is generally free from serum albumin. The cystoscopic appearances may vary according to the severity of the condition. If the pyuria is profuse, it can be seen as a cloudy spurt from the corresponding ureteral orifice. The functional activity, as indicated by phthalein or indigo-carmin, will be definitely diminished on the affected side. The blood count is not too reliable in a diagnosis of pyelitis. It is sometimes possible to get a high fever and pronounced pyuria with a fairly normal blood count. The diagnosis must depend on: (i) physical examination, (ii) individual urinary examination, (iii) individual functional tests, (iv) cystoscopic bladder findings.

Prognosis.

The prognosis depends on the extent and stage of the condition. Acute forms usually heal under appropriate treatment. On the other hand long standing infections are most difficult and often impossible to clear up.

Treatment.

In acute cases rest in bed and abundant water are necessary. Urinary antiseptics can be tried, but are of doubtful value. In chronic cases the same treatment *plus* pelvic lavage, abundant fluid and free drainage are the most important requirements with removal of the primary focus if possible. Urinary antiseptics and vaccines may be tried, but in our hands they have not proved of much value. Undoubtedly the most efficacious way of treating chronic pyelitis is by pelvic lavage. This form of treatment acts in two ways: (a) The passage of a ureteral catheter dilates the ureter and tends to establish good drainage; (b) a hyperæmia of the mucosa lining the pelvis is produced by the irritating action of the antiseptic as well as the bactericidal effect on the organisms.

The two most effective chemicals for this purpose are silver nitrate in from 1% to 5% solution, generally employed at 1%, and mercurochrome in the

same strengths. Germicidal substances may be applied locally, given by mouth or intravenously. Good results have been obtained by the intravenous injection of mercurochrome given in 1% solution five milligrammes per kilogram of body weight, especially in septicæmia.

Pyelitis in children often responds to large doses of alkali, sodium bicarbonate one to two grammes (fifteen to thirty grains) four times a day. Sudden switching to sodium benzoate or calcium chloride frequently helps. "Hexyl-Resorcinol" which has been much written up lately, helps according to reports, but we find it very liable to cause gastric disturbance without much urinary improvement. The essential thing is to eliminate any primary focus which may be in the naso-pharynx or intestinal tract, and to establish free drainage, otherwise chronic pyelitis will never clear up. Some people rely on this procedure entirely and do not bother with urinary antiseptics either locally or internally.

In conclusion it may be stated that if cases of pyelitis or pyelonephritis do not respond after a moderate course of ordinary treatment, it is not much use persisting with this type of treatment. There is undoubtedly some other condition complicating the pyelitis such as hydronephrosis, stone, stricture of the ureter or some other mechanical condition which must be diagnosed and rectified before there is any possibility of the pyelitis being cured.

SOME POINTS OF INTEREST IN RENAL LITHIASIS.¹

By R. K. LEE BROWN, M.D.,

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FROM the earliest days of surgery till the present time the subject of calculus formation in the urinary tract has been one of considerable interest. In this large continent there are certain conditions which make it more interesting than usual and for that reason it has been selected for review.

The ætiology of stone formation is not completely understood; there are many predisposing factors, any of which either alone or in combination with others may constitute the starting point of a urinary calculus.

In the first place the formation of stone must depend on the solubility of the salts being secreted. If large quantities of highly insoluble salts are being eliminated, there will be a greater chance of these being deposited than if the salts are highly soluble. From the standpoint of solubility no comparisons can be drawn between the results obtained in pure water and urine, as the conditions are not similar.

For instance the amount of uric acid present in a specimen of clear urine may be much in excess of the amount that can be dissolved in the same quantity of water. This difference is due to certain col-

loidal bodies present in urine whose function is to hold these more insoluble salts in solution and thereby facilitate their elimination.

Owing to the presence of these colloids urine, supersaturated as far as pure water is concerned, does not necessarily follow the same laws as water under similar conditions.

This action of keeping these salts from depositing is called the "protective action of the urinary colloids." The exact identification of these bodies has not yet been determined, but they are true colloids and are present in all urine.

The fact that stones are always composed of the most insoluble urinary constituents and not of such soluble substances as urea and sodium chloride, is not altogether due to their difference in solubility. The former are dependent for their solubility on a complex mechanism which is subject to derangement, while the latter substances depend on water which is stable. Anything which upsets the colloidal balance, will interfere with the protective action of these bodies and permit of salts being deposited. A good example of this is seen where there is any alteration of the surface tension. Urine may be passed into a glass and appear perfectly clear, but after it has stood for some time a sediment will be produced on the bottom of the glass or a scale on the sides which is a result of an alteration in the surface tension. While urine is in contact with the normal mucous membrane of the bladder no such deposition of salts occurs, but by introducing some foreign body, such as a hairpin or a chromic gut suture, an alteration in surface tension occurs and as a result salts become deposited.

It would seem that in many cases some foreign body causing an alteration in surface tension forms the original nucleus on which salts are deposited. This condition is frequently observed, but it is by no means universal, for it is quite common to find stones in which no evidence of any nucleus is present. When found, it is generally a clump of organisms or some piece of necrotic tissue derived from an infective condition in the kidney. This would seem to indicate that stone formation should be extremely common in chronic infections of the kidney, but patients go for a lifetime with severe pyelitis without ever forming a stone.

There seems to be some quality of the urine itself which determines whether it shall remain clear, cloudy or deposit salts. The clearness of the urine depends a good deal on its reaction. A urine, cloudy with phosphates, will become clear if its acidity be sufficiently increased.

In severe phosphaturia of years' duration, where urine passed into a vessel and allowed to stand will result in a very heavy deposit of thick phosphates, this quality or protective action of the urinary colloids is well seen. A patient whose urine is continually depositing about 25% of its bulk of thick phosphates in a glass, will go for years without forming a stone in the urinary tract. This is not altogether due to the protective action of the colloids, for in the first urine voided in the morning after the patient has been lying still, there may actually occur a deposition of phosphates frequently

¹ A post-graduate lecture delivered at the Royal Alexandra Hospital for Children, Sydney, 1927.

ILLUSTRATIONS TO THE ARTICLE BY DR. T. E. GREEN.



FIGURE I.
Showing Section of Liver (Low Power).

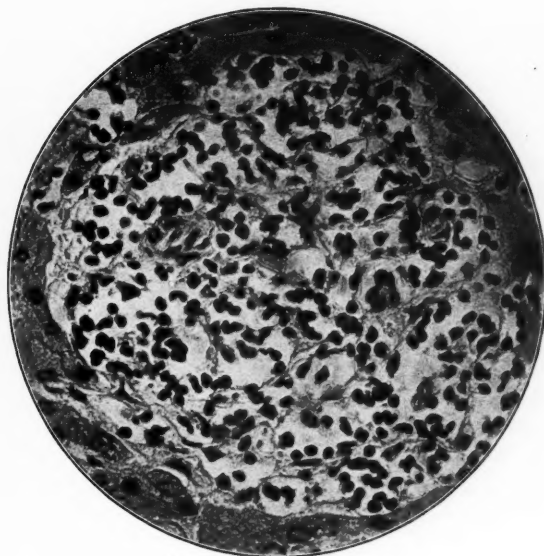


FIGURE II.
Showing Section of Liver (High Power).

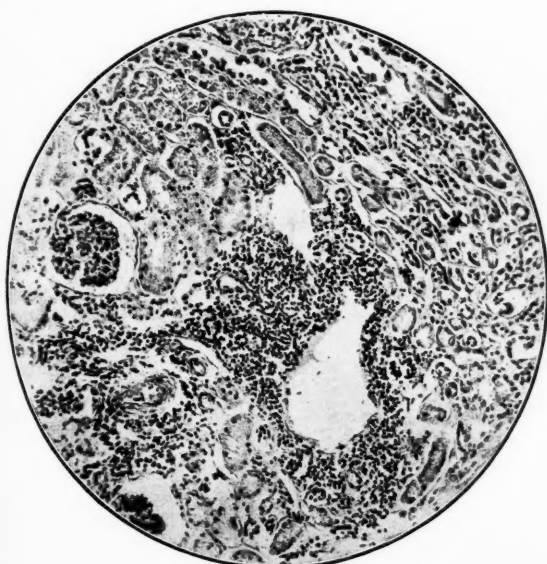


FIGURE III.
Showing Section of Kidney (Low Power).

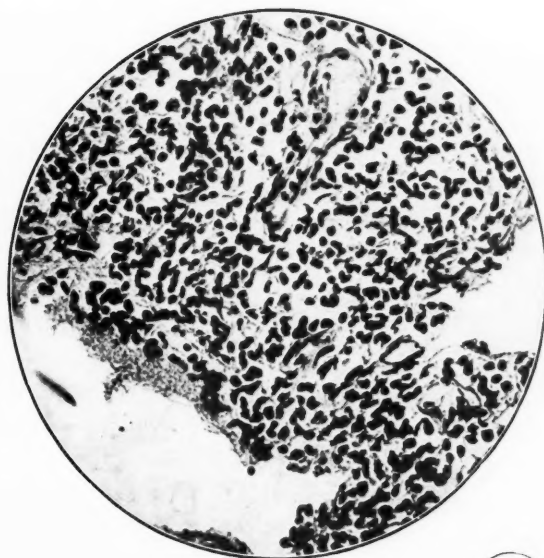


FIGURE IV.
Showing Section of Kidney (High Power).



ILLUSTRATIONS TO THE ARTICLE BY DR. T. E. GREEN.

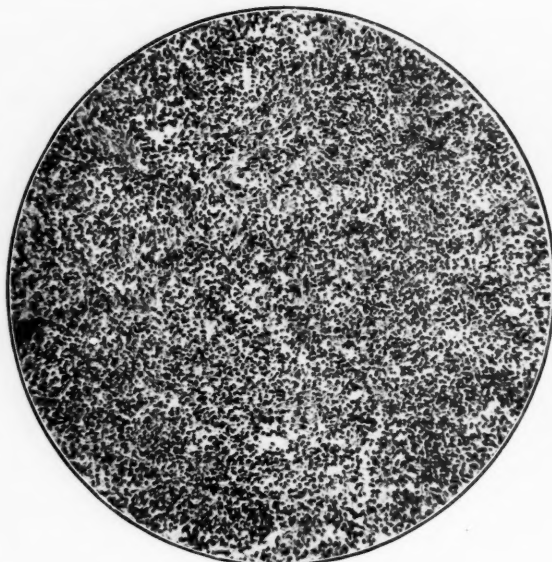


FIGURE V.
Showing Section of Spleen (Low Power).

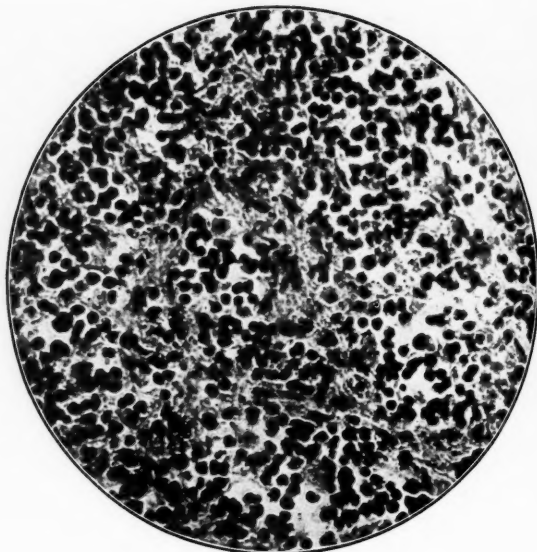


FIGURE VI.
Showing Section of Spleen (High Power).

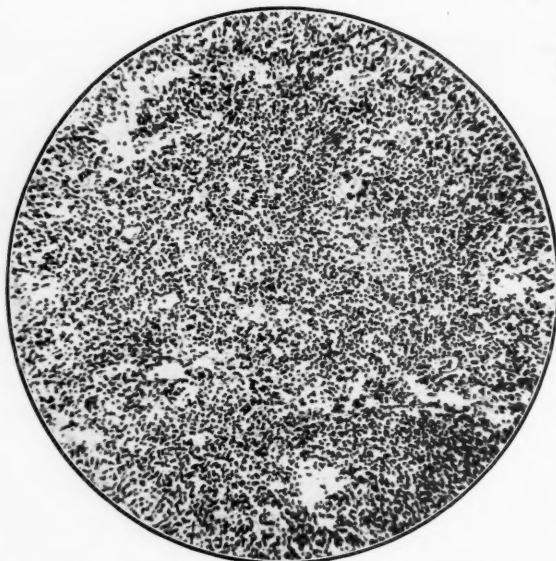


FIGURE VII.
Showing Section of Lymphatic Gland (Low Power).

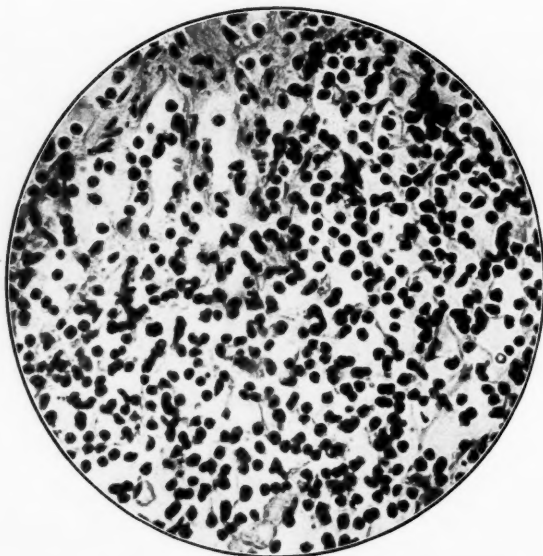


FIGURE VIII.
Showing Section of Lymphatic Gland (High Power).

ILLUSTRATIONS TO THE ARTICLE BY DR. T. E. GREEN.

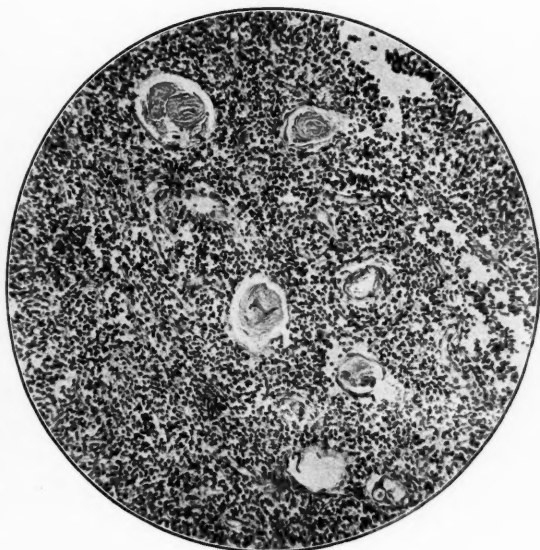


FIGURE IX.
Showing Section of Thymus (Low Power).



FIGURE X.
Showing Section of Thymus (High Power).

ILLUSTRATION TO THE ARTICLE BY DR. D. CAHALAN.

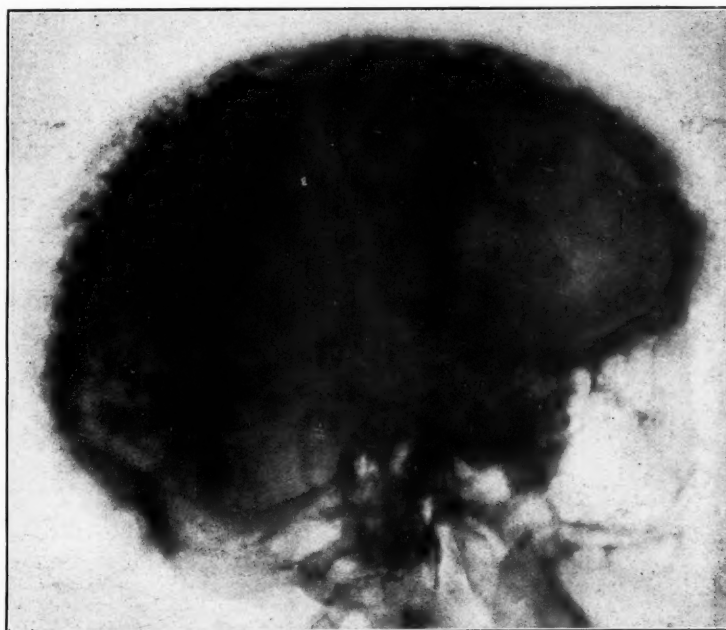


FIGURE I.
Showing Lateral View of Skull.



ILLUSTRATION TO THE ARTICLE BY DR. D. CAHALAN.



FIGURE II.
Showing Antero-Posterior View of Skull.

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seen as a thick creamy mass passed at the beginning or end of micturition. In these circumstances the formation has exceeded the amount that the colloids can keep in solution and in consequence they become precipitated. The amount of colloid in the urine has some relation to the quantity of urine passed. If a large amount of fluid be taken and a correspondingly large amount of urine passed, the fluid appears to carry more colloid through with it than if only half the quantity of urine were formed containing the same amount of urea and salts. In the event of an excessive formation of phosphate or other urinary salt with only a small amount of watery urine being formed, there will not be enough colloid present to keep these salts in solution and a deposition occurs. Under these conditions stone formation can occur without obstruction or residual urine being present. An example of this was recently seen in a young woman from the Islands. She has nursed a baby for two years and had been instructed not to drink water. In consequence her fluid intake had been a minimum. At the same time her fluid loss between feeding her child and the superficial loss through the heat had been a maximum, so that the least possible amount of fluid had been passed in her urine. The products of nitrogenous metabolism had been going on just the same and had to be eliminated. These under the conditions were in excess of the amount that could be kept in solution in the urine, and as a result a calculus had been formed completely filling the kidney pelvis. If this woman had been given plenty of fluid, it is probable that this stone would never have been formed, for though the constituent salts might not have been very soluble in water and might possibly have formed a supersaturated solution, yet the amount of colloid that an increased quantity of fluid would have carried through with it, would have probably been enough to keep all the salts in solution.

This type of case is frequently seen in certain inland areas of Australia. In some localities which are dependent on artesian wells for their water supply, stone formation is very common. These localities being well inland, are generally extremely hot and in consequence the superficial loss from evaporation is very great. In addition to this a great amount of physical work has to be done, so that the nitrogenous metabolism is high with a correspondingly large output of urea and salts. The bore water in some areas has an extremely high mineral salt content which makes it most palatable to drink. The men during their hard physical work and great fluid loss from perspiration naturally drink copiously of this bore water. The result of this initial fluid intake, very high in mineral salts, *plus* the metabolic waste products of great physical exertion together with an excessive fluid loss from superficial evaporation, leaves a very small quantity of urine overloaded with salts. Owing to the small quantity of fluid urine not enough colloids are included to keep all these salts in suspension and a deposition followed by stone formation results. Patients coming from these localities have stated that even the stock have renal stones. In some cases practically

every sheep killed is found to have stone in the kidney.

Next come those patients who are not subject to these special conditions of excessive fluid loss or to unusually high mineral salt intake. Here a new element enters into consideration and that is the presence of residual urine. It seems that where there is not a free drainage either from the renal pelvis or from the bladder, sooner or later something may occur which temporarily upsets the colloidal balance and urinary salts become deposited around some nucleus which may or may not be capable of demonstration. That this state of affairs frequently occurs without the presence of residual urine is highly probable, but under such conditions the original nucleus is not retained, but is washed out with the voiding of the urine without giving rise to any symptoms. In the event of there being a pocket of residual urine without free drainage this initial nucleus is retained and receives further deposits of salts from time to time, thereby increasing in dimensions until symptoms are set up directing attention to it.

The part played by infection in the formation of stone is still doubtful. So many badly infected pyonephroses are seen with a large amount of residual urine and gross infection without any suggestion of stone formation, that it seems that there are other more important elements than the infection itself instrumental in the formation of stone. The most interesting work yet done along these lines was performed by Rosenow, of the Mayo Clinic. In a demonstration of the specificity of organisms he took some streptococci from the teeth of a man who was badly infected by these particular organisms and whose kidneys were full of stones. With these organisms he infected the pulp cavity of the teeth of a series of dogs. The kidneys in most of these dogs at autopsy contained multiple small calcareous deposits which would seem to show the importance in some cases of focal infections as aetiological factors in the formation of stone.

The part played by infection is not so much of importance as an aetiological factor in the formation of stone as is the effect of its association with a calculus on the kidney function. An uninfected renal stone that is not causing obstruction may be present for years and may form a complete cast of the renal pelvis without giving rise to symptoms. This constitutes the so-called "silent stone." It is possible to have a stone of this type present and still have a reasonable amount of renal function remain in that kidney. If once a calculus causes obstruction, very definite symptoms are immediately set up and at the same time serious impairment of the renal function commences. This obstruction whether partial, intermittent or complete, leads to hydro-nephrotic changes which ultimately result in complete destruction of the kidney.

As stated previously, a stone that is not causing obstruction nor associated with infection, may be present for years without giving rise to distressing symptoms or to dangerous impairment of the functional activity, but once the stone becomes complicated by infection, then rapid and progressive

impairment of the functional activity generally occurs.

It is often surprising to observe how long a stone may be present in the kidney, whether complicated by an uninfected hydronephrosis or not, without giving rise to any of the usual localizing symptoms. There is, however, one fairly constant symptom set up which is rather misleading but nevertheless constantly present, that is, reflex renal dyspepsia. Patients will complain of indigestion and symptoms referred entirely to the digestive system. There may be no other symptoms unless the possible microscopical presence of a few red blood cells in the urine. Under these conditions the diagnosis of renal stone is sometimes made during a radiological investigation of the alimentary tract.

The subject of radiography in the diagnosis of renal calculus having been introduced, it may be well to state that this diagnostic medium is by no means infallible and that at times relatively large calculi are met which fail to cast a shadow on a correctly exposed radiographic film.

In order to appreciate the reason of this one of the standards of radiography must be remembered, that is the specific opacity of a substance depends on its atomic weight. From this it can be seen why the soft parts of the body, composed chiefly of hydrogen, carbon, nitrogen and oxygen, cast such a poor shadow.

A urinary calculus, generally being of complex composition, will have a relative opacity depending on the total atomic weight of its constituents and will be further influenced by its structure and thickness. If a calculus be composed chiefly of such constituents as calcium (atomic weight 40), potassium (atomic weight 39), sulphur (atomic weight 32) and phosphorus (atomic weight 31) it will naturally cast a dense shadow, but on the other hand as the atomic weight of the various constituents becomes less, so will there occur a corresponding diminution in density of the shadow cast. Calculi composed of uric acid, xanthin, urates and triple phosphates, are of such low atomic weight that they may fail to cast any shadow.

An interesting point with regard to the diagnosis of these transradiant stones is obtained from pyelography. When the renal pelvis is filled with a suitable pyelographic medium, stones which fail to cast any shadow on a plain radiograph, show as areas of deficient density as compared with the rest of the pyelogram.

As opposed to the transradiant stone the very definite shadow of a calcified gland might be mentioned. A gland of this type is frequently found exactly overlying the renal pelvis and simulating a renal stone in the most convincing manner. It is occasionally very difficult to distinguish between a renal calculus and a calcified gland overlying the kidney. Several diagnostic differences may be present:

1. The urine from that kidney may be quite normal suggesting a calcified gland.
2. The shadow may be outside the limits of a pyelogram.

3. The renal function of the kidney may be quite normal, again suggesting a calcified gland.

In considering the operative removal of a stone several factors have to be taken into account:

1. Is the stone giving rise to serious discomfort?
2. Is the stone causing or liable to cause any serious embarrassment of renal function?
3. Is the stone causing obstruction?
4. Can the stone be removed without destroying the kidney?

The essential requirement in removing renal stone is to insure its complete removal and to guard against small particles being left to form nuclei for further deposits. The solid more or less spherical stone, found associated with uninfected or only slightly infected urine, is usually the ideal one. This type of stone is generally found lying loose in the pelvis or in the lower calyx and can as a rule readily be removed through an incision made in the posterior wall of the pelvis.

When in addition to the calculus the kidney urine is alkaline and badly infected, it generally indicates two facts—there is serious renal disorganization and the stone or stones will probably be of the semi-soft variety with further calcareous deposits elsewhere in the pelvis. Under these conditions, if there is a healthy functioning kidney on the opposite side, nephrectomy is a more satisfactory procedure than an attempt at removing the stones. It is highly probable that some small particles will be left to act as nuclei for future calculi and in addition perinephritic adhesions will result which will render the inevitable nephrectomy technically much more difficult.

Staghorn calculi, those forming a complete cast of the pelvis, do not as a rule cause obstruction being firmly held in place by each calyx. This class of stone is extremely difficult to remove without extensive damage to the renal parenchyma and even then it is often not possible to remove it intact. This type of calculus is frequently a silent variety and gives rise to no local discomfort. Patients are commonly found having a large staghorn calculus which must have been present for years, and yet they are quite unaware of its existence. From the operative standpoint staghorn calculus must be considered from the following points of view: (a) Is it causing much discomfort? (b) Is the functional activity worth conserving? If a useful function still remains and the stone is not giving rise to much distress, it is better to leave it alone. In the event of its being badly infected and causing a toxic nephritis of the opposite, otherwise healthy kidney, nephrectomy is again the operation which should be undertaken. It is generally attempting rather an ambitious surgical feat to try a conservative operation on a kidney having a staghorn calculus of large dimensions. It almost invariably means splitting the kidney in two if the calculus is to be removed in its entirety. Such a procedure as this further damages an already impaired kidney and seriously imperils the surgical and functional result.

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RECURRENT INGUINAL HERNIA: ITS CAUSATION AND PREVENTION.¹

By H. C. RUTHERFORD DARLING, M.D., M.S. (Lond.),
F.R.C.S. (Eng.),

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Sydney.

A RADICAL operation on an inguinal hernia has for its primary object the cure of the protrusion. But while this is alike the desire both on the part of the surgeon and of the patient, yet very careful inquiry into the operative results reveals the disquieting fact that the recurrence rate is still high, ranging in indirect hernia from 3% to 10% and in the direct variety from 10% to 26%.

Bassini's operation marked a turning point in the history of inguinal herniotomy, for it has been only since its general adoption as the standard operation that one is justified in speaking of radical cures.

The fundamental steps of this operation consisted in splitting the aponeurosis of the external oblique sufficiently to expose the whole of the inguinal canal, separating the sac from the cord, transfixing it and tying it at the neck. Bassini then resected the distal portion of the sac and proceeded in the attempt to sew a three-ply musculo-aponeurotic layer, that is internal oblique and transverse muscles and the *fascia verticalis Cooperi* (old name for transverse fascia and *fala inguinalis*) down to the inguinal ligament.

Whilst the original Bassini operation and the Bassini modified by bringing the internal oblique and transverse muscles anterior to the spermatic cord, still have many advocates, there has been a noted tendency during recent years to reinforce these muscles by flaps derived from the external oblique aponeurosis—the Girard-Andrews imbrication method. The ever-increasing numbers of the already multitudinous modifications that have arisen during recent years, is convincing evidence that no one method is yet perfect and that there is still room for improvement.

Many surgeons delude themselves that they have very few recurrences, because they do not see them; but human nature is such that an unsuccessfully

operated-on patient does not as a rule return to the surgeon who originally operated upon him. On the other hand I side with those surgeons who believe that the published statistics are materially better than our results. The only reliable criterion for estimating the number of recurrences after the modern operation for hernia consists in the actual examination of these patients at stated postoperative intervals, say, at three months, at one year and at two years.

In Australia the follow-up system is too little developed to afford evidence of the after-results in a large number of cases; but no doubt they would differ only slightly from those of American, French, English and Dutch observers, in all of whom there is close agreement.

In 1924 B. L. Coley recorded the late results of seven hundred and seventy traced patients operated on for inguinal hernia. These were collected from 2,793 consecutive operations performed in New York. In these statistics minute analyses were made with reference to the sex and age of the patient and the variety of hernia present. These results are shown in Table I:

In this series a typical Bassini was the operation of election.

Coley's analysis of cases of simple, indirect inguinal hernia indicates that, whilst the results in children are uniformly excellent (no recurrences in 285 patients who were traced), in adults the results are far from satisfactory (29 recurrences in 355 patients who were traced, a percentage of 8.6).

The type of primary operation performed in the forty-nine cases in which a recurrent hernia appeared, is indicated in Table II.

Another point of practical interest is the variety of sac found in hernial recurrences. This is set out in Table III.

In 1923 Seward Erdman recorded 98.6% of recurrences by the end of the second year, 90.4% at the end of eighteen months, 73.9% at the end of twelve months and 47.9% within six months.

When the subsequent history of patients with recurrent hernia who are submitted to further operation, is investigated, the results are found

TABLE I.—SHOWING RESULTS IN 2,793 OPERATIONS FOR INGUINAL HERNIA, COLLECTED BY B. L. COLEY.

Type of Patient.	Type of Hernia.	Number of Operations.	Followed for Six Months to One Year.	Followed for One Year or Over.	Total.	Recurrence.	Recurrence Percentage.
Male child	indirect	1,013	89	174	263	0	0
Male adult	indirect	1,155	103	229	332	28	8.7
Male child	direct	4	0	1	1	0	0
Male adult	direct	280	28	57	85	14	16.4
Male child	direct and indirect	2	0	0	0	0	0
Male adult	direct and indirect	98	19	23	42	5	11.9
Female child	indirect	124	10	12	22	0	0
Female adult	indirect	113	7	16	23	1	4.4
Female child	direct	0	0	0	0	0	0
Female adult	direct	3	2	0	2	1	50.0
Female child	direct and indirect	0	0	0	0	0	0
Female adult	direct and indirect	1	0	0	0	0	0
Total		2,793	258	512	770	49	6.3

¹ Submitted for publication, May 31, 1927.

TABLE II.—SHOWING TYPE OF OPERATION FOLLOWED BY RECURRENCE.

Type of Operation.	Number.
Bassini	27
Bassini and imbrication	12
Bassini and rectus transference	10
Total	49

TABLE III.—SHOWING VARIETY OF SAC IN RECURRENT HERNIA.

Original Hernia.	Sac at Recurrence.	Number of Cases.
Oblique	Oblique	22
Oblique	Direct	4
Direct	Oblique	1
Direct	Direct	16
Oblique-direct (saddle-bag or pantaloons)	—	4

to be still more unsatisfactory. This may be seen by Table IV.

In the light of these figures it behoves surgeons to investigate carefully the cause or causes of failure to secure a permanent cure in adults operated on by the Bassini method or by one of its modifications.

Surgical Anatomy.

Anatomy forms the foundation on which every radical operation for inguinal hernia must depend, and although the subcutaneous ring and the anterior wall of the inguinal canal are well described in most anatomical textbooks, the posterior wall appears to have received rather scant attention. The posterior wall of the inguinal canal consists of the transverse fascia, a variable layer of extraperitoneal fatty tissue and the peritoneum. The lunular interval between the inferior margin of the transverse muscle and the inguinal ligament is protected by the transverse fascia, reinforced throughout most of its anterior surface by the *fals inguinalis* and the *ligamentum interfoveolare*, of Hesselbach.

The *fals inguinalis* consists of the lowest portions of the aponeurosis of the transverse and internal oblique muscles which, blending with each other, have a common insertion into the pubic crest and pubic tubercle, and also along the *pecten pubis* for a variable distance laterally averaging about 3.75 centimetres (one and a half inches). This aponeurosis lies immediately posterior to the subcutaneous ring

between it and the transverse fascia. Its lateral edge thins out and blends with the above fascia (see Figure I). The *ligamentum interfoveolare* is a fan-shaped bundle of fibres extending from the inferior border of the transverse muscle to blend inferiorly with the inguinal ligament. When well developed, the edges of the *ligamentum interfoveolare* and the *fals inguinalis* blend so that no medial inguinal fossa exists; this being considered the normal anatomical condition by certain Continental anatomists.

In the normal subject the transverse fascia forms a dense strong fibro-aponeurotic layer, firm enough to retain the viscera within the abdomen, for comparison, *dura mater* in cerebral decompression. Its strength can be readily demonstrated either in the operating theatre by passing a finger *via* the neck of a small-sized oblique hernia into the peritoneal cavity and then pressing against the posterior surface of this layer or in the dissecting room by endeavouring to push the index finger through this structure at any point except directly in the vicinity of the abdominal ring. The ring is a hiatus or hole in this fascia as can be readily demonstrated by separating the parietal peritoneum from the transverse fascia and viewing the ring from its abdominal aspect.

Torek points out that the *ductus deferens* and the spermatic vessels meet at this opening at an angle and he maintains that when an oblique inguinal hernia arises, it wedges its way through the ring between these two structures (see Figure II).

The extraperitoneal or subperitoneal fat, lying between the peritoneum and the transverse fascia, varies greatly in thickness, being as a rule very thin except in the vicinity of the bladder. In most cases of inguinal hernia a fatty protrusion ("pilot lipoma") runs a short distance down the cord and forms a useful guide when the surgeon is looking for the edge of a small hernial sac.

In rare cases overgrowth of this fat may occur so that it forms lipomatous-like masses in the cord. The presence of an excessive amount of extraperitoneal fat in this situation should serve as a warning of some abnormality, for example, the presence of the bladder. On inspection of the peritoneal aspect of the hernial region from behind three distinct fossae, formed by certain separate and prominent cords, may be readily demonstrated.

The supravesical fossa lies between the medial umbilical fold (middle umbilical ligament or urachus) and the lateral umbilical fold (obliterated

TABLE IV.—SHOWING RESULTS OF OPERATION FOR RECURRENT HERNIA.

Type of Operation Used for Recurrent Hernia (S. Erdman).	Oblique Recurrences.	Secondary Recurrences.	Direct Recurrences.	Secondary Recurrences.
Bassini (with stitch internal oblique to inguinal ligament)	8	1	11	2
Bassini (without stitch)	6	1	1	1
Bassini and rectus transference	2	0	3	0
Halsted's transplantation	3	0	14	4
Atypical	1	1	3	2
Total	20	3 or 15%	32	9 or 28.1%

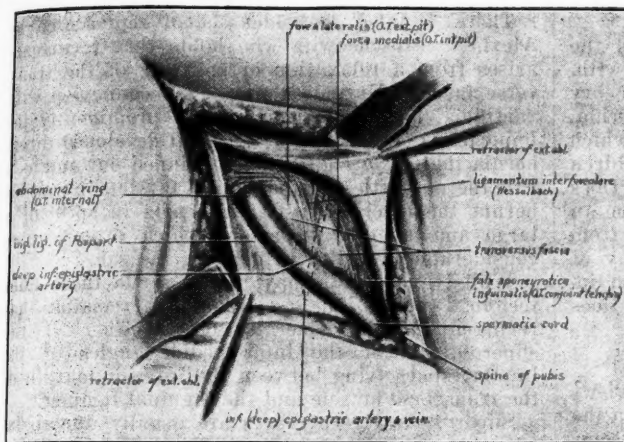


FIGURE I.
Showing Anatomy of the Inguinal Region (from Pitzman's "Anatomy").

umbilical or hypogastric artery); the medial inguinal fossa between the latter fold and the epigastric fold (inferior epigastric artery); whilst the lateral inguinal fossa lies lateral to the inferior epigastric artery. From each of these fossae a process of peritoneum may be developed, but most frequently from the lateral, for this is naturally the deepest of the three. Direct sacs usually arise from the medial inguinal fossa, but not infrequently a fibrous cord representing the obliterated artery is seen coursing over the dome of a direct sac, causing the sac to bulge forward on either side.

Oblique and direct hernia very often coexist in the same patient; in fact with a very large direct hernia there is almost always an indirect sac present on the same side.

Even when of only moderate size, a direct hernia is usually associated with an indirect sac, which may be quite definite or merely a small protrusion of peritoneum hidden in the upper part of the cord. The neglect of such a small sac is likely to cause a recurrence in the shape of an oblique hernia, no matter how well the direct hernia be repaired.

In massive hernia the inferior epigastric vessels may become indistinguishable, so that the two sacs become one. It is impossible in these cases to say whether the hernia started medial or lateral to the inferior epigastric artery, but in either case the result is the same—a giving way of the whole of the posterior wall of the inguinal canal.

Occasionally a small globular protrusion, similar in nature to an epigastric hernia, occurs just above the pubic bone between the margins of the rectus muscle and the *falx inguinalis*. Although often erroneously classed as a direct inguinal hernia, this is really a hernia of the *linea semilunaris*.

At this stage attention should be directed to the "inguinal shutter."

Keith considers that there are two guards to the inguinal canal; a superficial consisting of that portion of the external oblique muscle which, arising

from the eighth, ninth and tenth ribs, is inserted into the pubis on each side of the subcutaneous ring, and a deep guard consisting of the "inguinal sphincter" which comprises the inguinal ligament, *falx inguinalis* and that part of the combined internal oblique and transverse muscles which arises from the lateral portion of the inguinal ligament.

According to the above author when this combined muscle contracts, its lower edge becomes closely approximated to the inguinal ligament thus closing the inguinal gap. This phenomenon may be demonstrated by inserting the index finger into the inguinal canal and getting the patient to cough, when in a normal individual a grip will be felt caused by the contracting muscles. It may also be studied during the course of a herniotomy by allowing the patient to strain under the anaesthetic when the inguinal canal has been laid open.

In cases of direct hernia that portion of the internal oblique and transverse muscles, arising from the inguinal ligament (which usually consists of heavy muscular fibres extending well down over the abdominal ring and superior part of the inguinal canal) is frequently replaced by a thinned aponeurotic layer with a short muscular belly, thus leaving portion of the transverse fascia with little or no support.

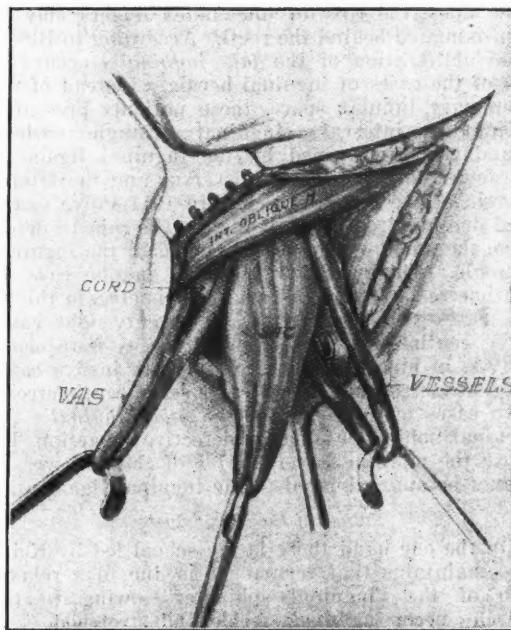


FIGURE II.
Showing the Abdominal Ring (Torek). The sac emerges between the spermatic vessels and the ductus deferens.

Surgical Physiology.

In children it is generally conceded that, if the neck of a recent oblique sac be efficiently dealt with, a permanent cure results. If the "saccular" theory be admitted with regard to oblique inguinal hernia, everything being equal, the same principle which guided us in the operative treatment in children should give equally good results in adults. Does our failure to obtain these results originate from an accompanying weakness of the muscles either from a delay in their development or from atrophy of the normal muscles due to the prolonged and increasing dilatation of the inguinal canal or does it arise from defects in the transverse fascia?

The Weak Spot.

At the present time surgeons hold diverse views as to the site and the nature of the weak spot in the abdominal wall which permits the hernia to recur.

Site of Weak Spot.

Bloodgood many years ago pointed out that recurrent hernia tended to appear at two sites: one, in the upper angle of the lunular space, in the vicinity of the spermatic cord, the other in the lower angle at the site of a weak, narrowed, attenuated or deficient *falx inguinalis*. In certain cases of direct hernia on the scrotum being invaginated the index finger enters a large relaxed subcutaneous ring and, meeting with little or no resistance, passes over the pubic bone into the space of Retzius. In these cases there appears to be no *falx inguinalis*, the internal oblique and transverse muscles being inserted into the rectus sheath at varying distances from the pubis. When this anatomical defect is present on both sides, the tips of the index fingers may be approximated behind the recti. According to Bloodgood obliteration of the *falx inguinalis* occurs in 5% of the cases of inguinal hernia. Instead of the customary lunular space, these patients present a triangular interval (inguinal triangle) whose boundaries are formed by the inguinal ligament, the lower border of the transversus and the lateral margin of the rectus muscle. In 1911 Polya examined one hundred cases of inguinal hernia to determine the amount of rectus included in the inguinal triangle. This was found to be: in one case no centimetres, in seven cases one centimetre, in thirty-one cases two centimetres, in twenty-eight cases three centimetres, in seventeen cases four centimetres, in nine cases five centimetres, in five cases six centimetres and in two cases seven centimetres.

In cases of deficiency of the *falx inguinalis* the inguinal sphincter must be defective in action, because the movable lower border of the transversus cannot be approximated to the inguinal ligament.

Nature of the Weak Spot.

On the one hand there is the school led by Keith who maintains that recurrence is due to a relaxation of the "inguinal sphincter" owing to the muscles becoming weak, feeble and stretched.

In the majority of cases of direct hernia the above sphincter is represented by a few small bundles of muscular tissue, loosely connected together by areolar tissue.

There is also the older school represented by Alexis V. Moschcowitz who holds that recurrence arises from a relaxation or splitting of the transverse fascia. Krymow's work⁽¹⁾ in connexion with "artificial hernia" brings forward prominently the importance of this fascia. In well developed direct hernia the *fascia transversa* is thinned out and as a rule there is little extraperitoneal fat, but in smaller hernia the fascia may be quite firm in spite of a large amount of fat present which often causes considerable difficulty in locating the sac.

Whilst anatomists may finally settle these finer technical points, the essential fact remains that recurrent herniae generally occur either at the superolateral or the inferomedial angles of the lunular space lying between the inferior margin of the transverse muscle and the inguinal ligament.

Superolateral recurrences are usually due to inadequate removal of the sac. They occur suddenly, usually very soon after operation and without pain.

In the other group the recurrence is direct and not only is there faulty development of the lower border of the combined internal oblique and transverse muscles, but also a coexisting weakness or deficiency of the *falx inguinalis*.

For the former one type of operation will be suitable and for the latter another and any attempt at dealing with both conditions by a standardized operation, as is so commonly done at the present day, is to be deprecated. The cure of inguinal hernia must depend upon the rectification of the above-mentioned anatomical defects.

Bassini aimed at sewing the transverse fascia and the *falx inguinalis* (*fascia verticalis* of Cooper) down to the inguinal ligament, but it is open to doubt whether he ever secured this result. Bassini's operation as performed by most modern surgeons consists of stitching the internal oblique *plus* transversus to the inguinal ligament.

The observations of Gallie and Lemesurier (1921), Oudard and Jean (1922), Seelig and Chouke (1923) and others on the anatomical results of this operation have shown universal failure to secure persistent union by the methods at present in vogue between these muscles and the inguinal ligament.

In an operation for a recurrent inguinal hernia the aponeurosis of the external oblique is usually found slightly adherent to the superficial and sub-jacent tissues and perfectly intact. The internal oblique and transversus are found in their normal anatomical positions; a few fine cicatricial adhesions may be present between these muscles and the inguinal ligament. Otherwise the union of these structures has completely failed.

Lameris contrasted the results obtained in a group of patients subjected to the Bassini operation with the usual stitching of the internal oblique *plus* transversus to the inguinal ligament with those obtained in another group of patients operated upon with absolutely the same technique, except for the omission of these stitches. These are set out in Table V.

The difference of 0.4% is well within the normal variation of figures and would tend to indicate that the dislocation of the lower margins of the com-

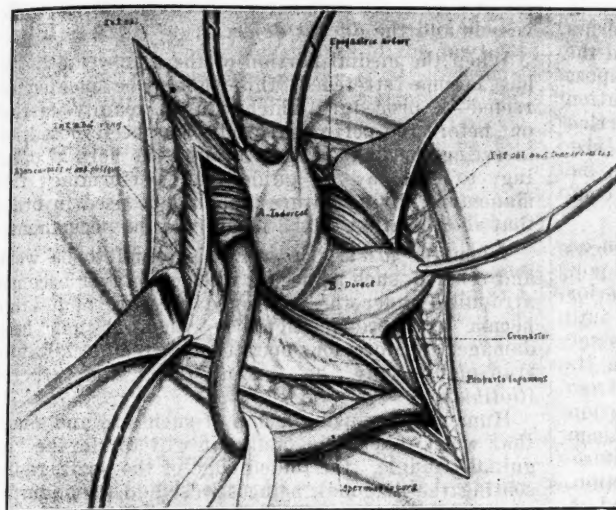


FIGURE IIIA.
Illustrating Hoguet's Manœuvre (Downes), with a combined direct and indirect Hernia "Pantaloons Sac."

combined internal oblique and transversus is an unessential part of Bassini's operation.

TABLE V.—SHOWING RESULT OF STITCHING INTERNAL OBLIQUE MUSCLE TO THE INGUINAL LIGAMENT.

Oblique Hernia (only) Type of Operation.	Number of Cases.	Recurrence One to One and a Half Years.	Percentage.
With stitch ..	511	20	3.9%
Without stitch	620	27	4.3%

The importance of high ligation of the neck of the hernial sac was prominently pointed out by W. S. Halsted in 1889 when he wrote:

The abdominal cavity is closed by mattress sutures passed through the peritoneum at a higher level by one and a half inches than that of the so-called neck of the sac.

If a hernial sac be ligated at its neck instead of at its mouth a smaller or larger peritoneal dimple will be left, forming an excellent starting point for a recurrence. The complete cure of an inguinal hernia therefore necessitates an adequate removal of peritoneum so as to secure the obliteration of the natural depressions of this layer and the restoration of the posterior wall of the inguinal canal.

Resection of the Hernial Sac.

It is absolutely essential for the surgeon to determine whether he has to deal solely with a direct or oblique hernia or with a combination of both.

An oblique sac may be exposed either at its neck or its mouth. In the former

case the cremaster muscle (and fascia) together with the internal spermatic fascia are incised longitudinally and search is then made for the sac. In the latter the cord is retracted laterally and, commencing on the medial aspect, the tense internal spermatic fascia is then divided so as to expose the medial edges of both the sac and the opening in the transverse fascia. Blunt dissection is continued laterally until the whole abnormal ring is clearly displayed and the *ductus deferens* and spermatic vessels are seen turning backwards, usually separated by a distinct interval.

The finding of the sac is easier if the latter plan be adopted, but its isolation is certainly more difficult. Traction is now made on the sac and all tissues external to the sac are wiped away with a piece of gauze, assisted only occasionally by a snip with the scissors.

A free separation of the parietal peritoneum is then secured, as advocated by E. Wyllys Andrews in 1906, by sweeping the index finger round the mouth of the sac in the interval between peritoneum and transverse fascia. Free removal of the mouth of the sac is then obtained by inserting the forefinger into the fundus and pulling up the slack peritoneum from beneath the transverse fascia (Villandre's manœuvre), whilst any fat is separated by gauze dissection. This procedure must be carried out with the greatest gentleness, because at this site the peritoneum is often thin and therefore easily torn. The peritoneum is then clamped, the sac excised and the cut edges sutured by Number 2 chromicized catgut.

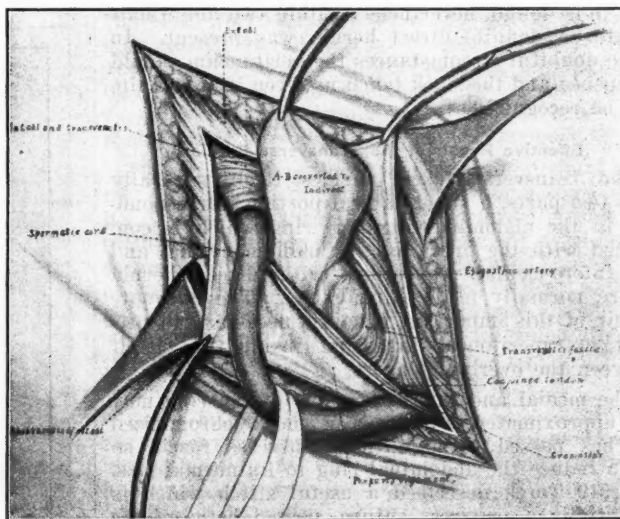


FIGURE IIIB.
Illustrating Hoguet's Manœuvre (Downes) with a combined Sac converted into an indirect Hernia.

As mentioned before, an oblique sac can often be found in direct hernia, hence in this type of hernia lateral traction should be made on the cord and the internal spermatic fascia divided so as to expose any small oblique sac present. This investigation is absolutely essential and should always be carried out in direct herniotomy, irrespective of the size and location of the sac; for in no other way can the error of overlooking the oblique portion of a combined sac be avoided.

Hoguet found that by making lateral traction on the oblique sac all the peritoneum of the direct portion could be pulled laterally under the inferior epigastric vessels and the two sacs converted into one (see Figures IIIA and IIIB). If no oblique sac be found, the direct sac should be opened on its lateral aspect in order to keep as far away from the bladder as possible and adequate isolation secured by inserting the index finger into its lumen to exert traction, whilst the fat lying on its inferomedial aspect is separated by gauze dissection. When the lower limits of the sac are reached, a number of small blood vessels will be encountered and a small tongue-like projection of pale muscle fibres (bladder) observed. During this dissection the glistening white obliterated umbilical artery may be encountered and should be divided if it interferes with adequate dissection.

The sac is then removed along precisely the same lines as for an oblique hernia.

It follows therefore that in every operation of inguinal hernia careful search should be made on each side of the inferior epigastric artery to determine the possible presence of a "saddle-bag" sac, one portion of which may be readily overlooked. Similarly when operating on patients with bilateral direct hernia, a direct sac may be overlooked. In a case report that recently came under my notice it was stated that at the primary operation no sac was to be found, nevertheless within two and a half months a definite direct hernia was present. In these doubtful circumstances the peritoneum should be opened and the slack taken up, even if no definite sac be recognized.

Effective Repair of the Transverse Fascia.

The transverse fascia divides itself naturally into two parts, a superolateral portion, corresponding to the abdominal inguinal ring which is concerned with the operation for oblique hernia, and an infero-medial, concerned with direct hernia where normally no opening exists. The adequate repair of this important fascia is necessary to prevent extraperitoneal fat from insinuating itself between the overlying layers.

The medial and lateral margins of the ring may be approximated by two or more chromicized stitches passed through the transverse fascia so as to reduce the abdominal ring to its normal size. In 1919 Torek described a useful stitch which is essentially a mattress suture, passed between the *ductus deferens* and spermatic vessels so as to secure approximation of the margins of the ring. In an average, fairly large oblique hernia there is room

for at least three such sutures between the spermatic vessels and the *ductus deferens*.

When the medial portion of the transverse fascia has become stretched, this should be pleated or reefed—a procedure which can be readily carried out before the peritoneal cavity has been closed, by inserting the index finger through the hernial opening to act as a guide. In performing this manoeuvre "living sutures" should be used in order that the plication of the fascia may be permanent.

When the *fascia transversa* is found to be weak and relaxed, such as occurs when this layer becomes atrophied under the continued pressure of a large hernia or more particularly when it has been damaged by a previous operation, a free fascial autotransplant may be taken from the *tractus iliotibialis*.⁽²⁾

Hume advises using a flap of such size and shape that when folded diagonally it will fill in the "inguinal triangle," the folded edge of the graft, representing the diagonal, being stitched to the inguinal ligament. Firm union of these "patch transplants" can be secured only by freely overlapping the edges and scraping and scarifying the surfaces which have to be placed in apposition, otherwise the scar tissue at the site of adhesion gives way or stretches and the hernia is prone to recur.

The advantage of neighbouring pedicled flap with its temporary superior lymphatic circulation is more than counter-balanced by the reduction in the strength of the abdominal wall.

A semicircular flap, derived from the internal oblique layer of the rectus sheath, is occasionally turned over from above through 180° and sutured to the inguinal ligament, but an additional objection to this method (Woelfler and Halsted) is that the base or "hinge" at the lateral margin of the rectus has no firm attachment on its medial side, there being no posterior rectus sheath (see Figure IV).

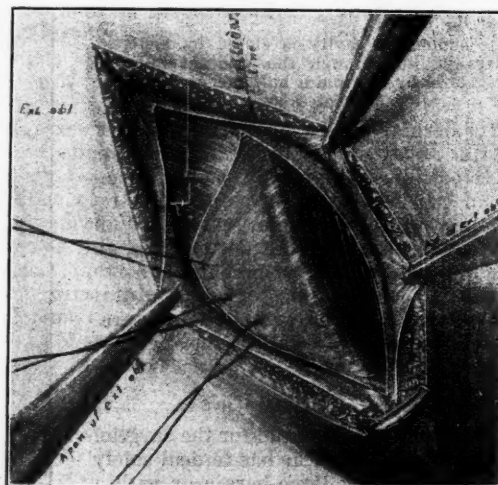


FIGURE IV.
Showing Pedunculated Fascial Autotransplant
(Halsted).

Bloodgood's procedure of incising the rectus sheath, mobilizing the muscle and suturing its lateral edge to the superior surface of the inguinal ligament, not only is open to the same objections as transplanting the combined internal oblique and transverse muscle, but also it weakens that portion of the abdominal wall which is supported by the rectus muscle (see Figure VI).

It is inadvisable to pull down and suture the unopened rectus sheath. There is an established surgical axiom that edge to edge suture of aponeurosis or fascia should be undertaken only when the tissues can be brought together without tension and where the subsequent physiological strain will be slight. In certain cases of deficient musculature Mantelli advocates the use of portion of the *sartorius* to reinforce the abdominal wall.

Reinforcement of the Posterior Wall of the Inguinal Canal.

In the past surgeons have largely ignored general or localized weaknesses in the transverse fascia and have attempted to remedy these defects by placing a buttress of aponeurotic or muscular tissue anterior to the *fascia transversa*.

In 1898 Alexander Bremer⁽³⁾ endeavoured to utilize the cremaster muscle by suturing the lower edge of the split cremaster to the lower border of the internal oblique. A modification of this procedure is a well known and important step in connexion with the performance of Halsted's operation.

The artificial insertion of the internal oblique and transversus into the inguinal ligament is, however, more extensively practised. It has already been pointed out that by the methods at present in vogue there has been almost universal failure to secure persistent union between the combined muscles and the inguinal ligament.

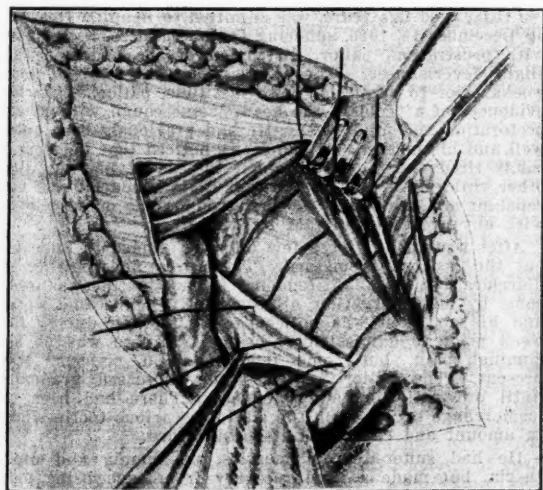


FIGURE VI.

Showing Rectus Transference (Schley). The rectus sheath is incised for 7.5 centimetres (three inches) and four sutures are inserted.

In 1926 Koontz, of Chicago, pointed out that if "cleaned," that is, scarified, muscle be sutured to fascia, the muscle would unite to the fascia by union of its fibres with the fibrous components of the muscle. Hence not only must both fascia and muscle be stripped of all connective tissue and fat, but they must be united by suture material that lasts sufficiently long for the establishment of firm union.

At the present time it is unknown exactly how long in a given case it takes for plastic material to be thrown out by such tissues as the transversus, inguinal ligament *et cetera* in sufficient amount to unite them, nor how long it will take that plastic material to become sufficiently strong to hold definitely the said structures firmly together. The use of free fascial transplants in the form of sutures was first advocated by McArthur, of Chicago, in 1901. This method has recently been reintroduced by Professor Gallie, of Toronto, who proved by experiments on animals that fascial sutures lived and remained unchanged (see Figure V).

The uncertainty which attends healing by scar tissue is thus totally eliminated and the responsibility of securing persistent union between the combined internal oblique and transversus falls upon these sutures. The chief precautions to be observed are to see that the sutures are woven strongly into the above tissues with as many bites as may seem necessary, so that the posterior wall of the inguinal canal becomes supported by a permanent meshwork of *fascia lata* which is sufficiently strong to withstand all variations in abdominal pressure.

The sutures should be passed through different levels in the inguinal ligament so as to prevent splitting and tearing of its fibres. The lowest or first stitch transfixes the reflected portion of the external oblique aponeurosis, about 1.2 centimetres (half an inch) above where it meets the *falx inguinalis*, picks up the lateral portion of the falx and then enters the lower part of the inguinal ligament (Coley and Hoguet), the needle being passed sufficiently deeply to scrape the bone and thus include portion of the lacunar ligament.

The cord is then placed in the inguinal canal and the aponeurosis of the external oblique sewn over it. Whenever a large hernia has caused stretching of this aponeurosis, the edges should be overlapped so as to take up the slack. Sutured fascia or aponeurosis, especially if reinforced by overlapping, will endure and withstand a certain amount of stress and strain, provided that all fatty and areolar tissue are thoroughly and completely removed from the coaptating fascial surfaces.

Since broad plication gives the greatest surety for permanent and secure union, it would appear advantageous to split the external oblique aponeurosis as far from the inguinal ligament as possible so as to furnish a long inferior flap. The inferior border of the superior flap is then stitched to the inguinal ligament whilst the inferior flap is closely applied to its superficial surface (see Figure

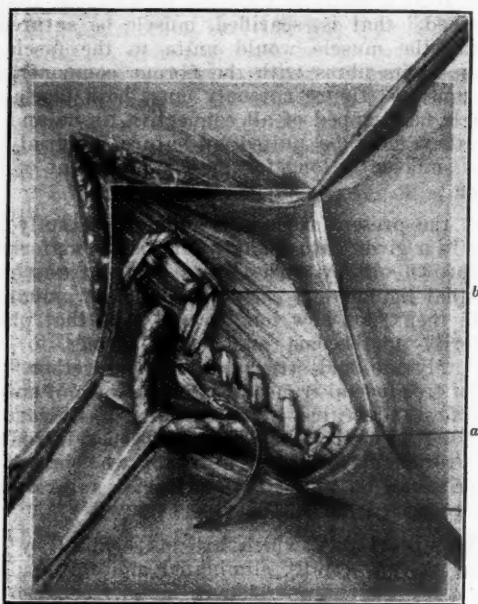


FIGURE V.
Showing Internal Oblique and Transversus sutured to the Inguinal Ligament by "Living Sutures" (Gallie). *a* = slip-knot anchoring stitch, *b* = lockstitch.

VII). At the subcutaneous ring the normal triangular slit, just large enough for the cord, is reproduced as nearly as possible.

It therefore follows that, instead of forcing the adoption of a stereotyped operative procedure, however good it may be, the operative measures should

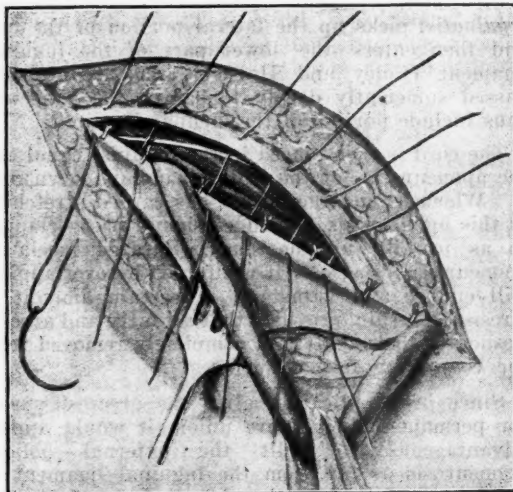


FIGURE VII.
Showing Imbrication of External Oblique Aponeurosis (Stettin). The inferior border of the superior flap is sutured to the inguinal ligament.

depend upon the anatomical findings in each individual case. Bassini's operation is absolutely inadequate for direct hernia and great care must be exercised in the selection of a suitable operation for each individual patient. Whilst the great majority of direct herniae fall into two general groups—the usual form in which the protrusion occurs through the medial inguinal fossa and the combined direct and indirect type—yet an operation which will prove satisfactory in one patient, may be wholly inadequate in another. In certain patients the inguinal sphincter may be well developed, whilst in others it will be thin and weak and associated with a large sac whose mouth extends almost from the inferior epigastric artery to the pubic bone.

Conclusion.

In conclusion, the cure of hernia must depend upon the rectification of the various anatomical defects present and any attempt to deal with all types of inguinal hernia by a standardized operation is wholly to be deprecated.

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Reports of Cases.

A CASE OF ACUTE LYMPHATIC LEUCHÆMIA, POSSIBLY ALEUCHÆMIC.

By T. E. GREEN, M.B., Ch.B. (Melbourne),
Bendigo, Victoria.

Clinical History.

J.H.L., aged five years, was admitted to Bendigo Hospital on December 16, 1926, suffering from weakness, listlessness with prostration, pallor, distension of the abdomen and slight feverishness. The illness commenced about four weeks prior to admission with lassitude, pallor, headache, evidences of a "cold in the head," some cough without expectoration and mild fever. He had previously been quite well and his mother (by adoption) noticed that he seemed easily tired and would lie about instead of playing with other children as was his custom. His headache was not constant and the cough was not troublesome or associated with any great difficulty of breathing.

After rest in bed for a few days he seemed to improve, but the lassitude remained. There was no vomiting or diarrhoea, but the slight tendency to constipation was overcome by mild purgation. Subsequently he became worse and his abdomen was noticed to be swollen during the week prior to admission to hospital. There was no abdominal pain, but some tenderness on pressure was present. The pallor and lassitude increased gradually until prostration was pronounced. There had been no hæmorrhage except from the site of a carious tooth, slight in amount and ceasing of its own accord.

He had suffered from measles, pneumonia and diphtheria, but made a good recovery from each being only fourteen days in hospital with diphtheria. No information was available in regard to the family history. The child had been adopted by a foster mother from the State.

On examination the child was very pale, his lips and ears being devoid of colour. There were a few small

ecchymoses on his right ear and the right side of his face, but in no other locality. The prostration was very pronounced, the child lying on his right side, curled up, taking no notice of anything, but resenting any change of position. The temperature was 37.8° C. (100° F.), the pulse rate was 140. The pulse was regular and easily compressible. The respirations numbered 30 in the minute. The tongue was moist and slightly furred. The teeth were in fair condition, but a few carious ones were present. The throat was normal. No evidence of enlargement of tonsils was found. There was no tenderness over the sternum. Enlarged glands were noticed on both sides of the neck in the axillæ and groins. They were not very large, were discrete and not tender. The apex beat of the heart was on the fifth space inside the nipple line. The first sound was reduplicated and the second somewhat accentuated at the apex. No definite bruit was present. The systolic blood pressure was 60 millimetres of mercury. Examination of the lungs revealed poor expansion, but the air entry was clear. No adventitious sounds were audible. There was no evidence of any pleural effusion.

The abdomen was very distended, no definite tenderness was present. The spleen was much enlarged reaching to the left iliac fossa and across to the umbilicus. The notch was easily felt. There was slight enlargement of the liver. The pupils were equal and reacted to light. There was no evidence of any involvement of the cranial nerves or of any muscular paralysis. There was no neck rigidity. The urine was acid. Its specific gravity was 1020. It contained no sugar, but a trace of albumin was present. Examination of the blood yielded the following results:

Erythrocytes per cubic millimetre..	1,950,000
Hæmoglobin value	30%
Colour index	0.75
Leucocytes per cubic millimetre ..	7,500
Small lymphocytes	85%
Polymorphonuclear cells	5%
Mononuclear cells	6%
Eosinophile cells	2%
Myeloblasts	2%

There was thus a large preponderance of lymphocytes of the small variety.

The red cells manifested irregular staining, vacuolation, polychromasia, variation in shape and size with a fair number of large cells, scattered, nucleated forms, normoblasts and megaloblasts. Later counts revealed an even smaller number of white cells, still with an overwhelming preponderance of small lymphocytes. The anæmia and weakness became more extreme, vomiting supervened and became troublesome. The temperature was remittent in type varying from 37.2° to 38.3° C. (99° to 101° F.). The spleen diminished in size to about two-thirds of its extent on admission, but there was no coincident improvement in the general condition. Death occurred on December 25. At no time were there any hemorrhages, sweats or rigors.

Post Mortem Findings.

Macroscopical Appearances.

The lungs were practically normal in appearance and on palpation except for some slight adhesions at the outer part of the left base. No excess of pleural fluid was present. Slightly increased fluid was present in the pericardial cavity. This was probably terminal and in part of post mortem origin. The heart was within normal limits in size and was slightly redder than normal especially on the right side. The right side of the heart was obviously damaged, the muscle was spoiled and blood vessels were engorged. The thymus was apparently not enlarged; it was pale and firm. On examination of the abdomen slight bile staining in area of gall bladder on the under surface or the liver was found. No excess of free fluid was present in the peritoneal cavity. The liver was somewhat enlarged, pale and firm. The spleen was greatly enlarged and of a dark plum colour, but it was firm and was apparently not the enlarged spleen of toxic poisoning. The kidneys were normal in size. They were pale and firm. The stomach and bowel showed no evidence of distension or focal infection of the wall. On examination of the central glandular system it was seen that all the lymph glands of the thorax and abdominal cavity both central and mesenteric were of reddish brown

colour. They stood out as if stained against the pale background of the surrounding tissues and organs. Portions of liver, kidney, spleen, thymus and rib were removed for microscopical section. No examination of the limb bones was made.

Microscopical Appearances.

I am indebted to Dr. Gordon Cameron for the following report of the microscopical appearances.

The capsule of the liver is not thickened, but slightly infiltrated by cells here and there. The liver substance is infiltrated by cells of the lymphocyte type—diffusely and in nodular collections—the latter being specially distributed about the portal canals, the former pericellular. There is atrophy of the external portion of the lobule in places with wide separation of liver columns and attempted regeneration in the part of liver cells. A few new bile ducts are seen growing out from the portal canals into these areas. The arterioles are thickened with swollen, active-looking endothelium and fibroplastic proliferation. Some hyaline degeneration is noticed (see Figures I and II).

The capsule of the kidney is normal. Glomeruli are numerous with normal Bowman's membrane. A few are shrunken, but not adherent to the capsule. The glomerular space is sometimes dilated suggestive of obstruction to the uriniferous tubule. There are cellular groups surrounding some glomeruli and invading a few. The tubules are mostly normal, but some are atrophied and occupied by cell masses. Some attempt has been made at regeneration. Except for moderate arteriolar thickening and endothelial activity the blood vessels are normal. The cell accumulations occur chiefly at the junction of cortex and medulla and in the cortex. The medulla is practically free, especially about arteries and arterioles. This invasion is lymphocytic in type with a few large mononuclear cells and fibroblasts (see Figures III and IV).

The capsule of the spleen is irregularly thickened. The vessels are thick walled with hyaline degeneration. There is a packing of splenic sinuses with mononuclear cells mostly lymphocytic in type. Large mononuclear cells are active, but no Sternberg's cells occur. There is considerable hæmolytic and proliferation of stroma in the region of arterioles and capillaries (see Figures V and VI).

The capsule of the lymphatic glands is slightly thickened. Trabeculae are easily detected and somewhat thickened. There is diffuse uniform infiltration with mononuclear cells of small lymphocytic type. Arterioles have an active endothelium and thickened walls. There is very little large mononuclear activity (see Figures VII and VIII).

The thymus manifests similar lymphocytic and large mononuclear activity and fibroplastic proliferation. Thick bands of fibrous tissue are seen spreading throughout the gland. Hassall's capsules are large and numerous. Hemorrhages have occurred in places (see Figures IX and X).

Comment.

Among the features of particular interest in the foregoing case are the absence of hæmorrhage and the total absence of any ulcerative or septic condition of the mouth or throat. The low white cell count is an unusual feature, but in this, as in other cases, it is possible that there had been a high white cell count during the few weeks before the patient entered hospital and the condition was recognized. Apart from the occurrence of hæmorrhage the onset of this condition is so insidious that a few weeks may elapse during which time there may be a leucocytosis and this may have disappeared as a result of the intensity of the toxin inhibiting the blood forming tissues from pouring their cells into the blood stream in the effort to protect. In this case the blood picture coupled with the splenic enlargement and the clinical history left no room for doubt as to the correct diagnosis which was abundantly confirmed by the post mortem appearances. It seems rather extraordinary that with the packing of the organs with lymphocytes, as is well shown in the microphotographs, the blood stream should contain relatively few suggesting perhaps that there had been a flooding with these cells in the earlier states and that lymphatic invasion of the organs occurred in the earlier stage and once having become extravascular remained there.

Acknowledgment.

I have to acknowledge my indebtedness to Dr. McIntosh who made the blood examinations at the Commonwealth Laboratory and also made the *post mortem* examination. I am under great obligation to Dr. Gordon Cameron, of the Walter and Eliza Hall Institute for Research in Pathology and Medicine, for his report and to Dr. Maudsley at the same Institute for the excellent sections and pictures. To Dr. Street, my house physician at the Bendigo Hospital I also am in debt for his care in collecting the notes and previous history of the patient.

PAGET'S DISEASE OF THE SKULL.¹

By DOMINIC CAHALAN, M.B., Ch.M. (Sydney),
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Vincent's Hospital, Sydney.

THE patient, a married woman, aged sixty-nine years, was first seen on January 10, 1927. She complained of deafness and of noises in the head and had pain over the left eye and in the left side of her head. She complained also of some pain in her left knee and of frequency of micturition and of a tendency to fall to one side.

She had three children. She had suffered from rheumatic fever at the age of twenty-eight and had undergone no surgical operations. She first noticed the enlargement of her head on leaving hospital five years ago, when she had been under treatment for some rheumatic trouble. She found it necessary to have her hats made to order.

On examination it is seen that the patient has considerable enlargement of the head. The enlargement is more pronounced on the left side and the temporal vessels stand out prominently. The heart's action is strong with a labouring beat, but otherwise it appears to be normal. The systolic blood pressure is 180 and the diastolic pressure 100 millimetres of mercury. The urine is normal. An old arthritic change is present in the left knee joint. The blood serum has not reacted to the Wassermann test. An X ray examination was carried out by Dr. Bede Harrison who made a diagnosis of Paget's disease of the skull. It is remarkable that there does not appear to be any involvement of the long bones nor of the clavicle. No pronounced kyphosis was present. As may be seen in the accompanying illustration the skiagrams reveal an interesting condition of rarefying osteitis.

Reviews.

THE WORKING OF GENIUS.

GENIUS has been aptly described by Dr. F. Guy Griffiths as a capacity for doing with ease what others do with pains and for doing with pains what others cannot do at all. The definition of genius, however, by describing its attributes is one thing; to understand its nature and origin is another. The latter has been attempted by Arthur C. Jacobson in his book "Genius: Some Revaluations." This book is founded on a study of the geniuses of literature and is full of interest to medical practitioners with literary inclinations. The author holds that genius resides "in the secondary personality of a person of superior mental endowment." There is "nothing in the primary self of the genius accounting for his creative powers save his superior mind—a *sine qua non* for the successful operation of the genius endowed secondary personality." An example of this dual personality is J. M. Barrie and "McConnachie," the chap who really wrote the plays. Barrie describes McConnachie as his "writing half," a fanciful odd sort of person, likely to do almost anything, while he himself is a serious-minded man, ready to bow to all conventions. "Paralyse the inhibitions of an appa-

rently ordinary peasant and you get a Bobbie Burns." The author discusses several means of bringing about this paralysis. The two most potent agencies are alcohol and tuberculosis. The influence of the former in giving rein to the imagination and to unusual flights of eloquence is a matter of common knowledge. What speeches of surpassing wit and scintillating brightness have been made after a dinner at which the wines have been chosen with care and consumed in not over-careful moderation! Jacobson's list of alcoholic geniuses is formidable and his discussion of their prowess is interesting. Thus, Robert Burns:

O! Whiskey! soul o' plays an' pranks!
Accept a Bardie's gratefu' thanks!
When wanting thee, what tuneless cranks
Are my poor verses!

Omar Khayyam's reply to a government which wanted to assist him was: "Place me, where . . . wine in abundance may inspire my muse."

In regard to tuberculosis Jacobson has much to say about the *spes phthisica*, that merciful gift of Nature to those afflicted by tuberculosis. If tuberculosis "tends to unfit its victims for material success, it also tends to quicken and to inspire the intellect—a divine compensation." The tuberculous geniuses described by the author are numerous and include such persons as Saint Francis of Assisi, Balzac, Goethe, Jane Austen, Shelley, Keats, Elizabeth Barrett Browning, Robert Louis Stevenson, Francis Thompson, Emerson and many others. He also shows how ethnic considerations have a distinct bearing on the production of genius.

The author discusses the well known association of genius with degeneracy; he is at great pains to show that genius is not identical with degeneracy, insanity or disease. The genius is "related only to the left wing of humanity," there is "no vestige of the Rotarian in him."

It is a pity that the author has confined his study to the geniuses of literature. His discussion on the geniuses of science and of medicine would have been interesting, as also would have been his attempts to discover for each an agency for the inhibition of the primary self. There are those who will disagree with at any rate some of the author's conclusions and possibly with his method of attacking the subject, but all will acknowledge that his book is informative and attractively written.

A RÉSUMÉ OF VENEREAL DISEASE.

In the third edition of Wansey Bayly's "Venereal Disease," which follows the previous edition after a period of three years, will be found a handy and well arranged account of the subject with which it deals.¹ That "prevention is better than cure" is an accepted axiom and the author, who is Honorary Secretary of the Society for the Prevention of Venereal Disease, devotes the opening section of his little volume to a spirited advocacy of its policy. While fully appreciating his zeal, we regret that in a volume, intended primarily for students and general practitioners, the practical difficulties which stand in the way of realization of this ideal, are not more fully expounded.

Apart from the section on prevention which has been lengthened, additional information has been included dealing with the treatment of general paralysis and tabes by protein shock, including malarial inoculation. In the section dealing with gonorrhœa, due regard is paid to diathermy treatment and the chapter on the disease in the female has been amplified. In a section on non-specific lesions an account of scabies and pediculosis is included, together with a note on hydrocele and in the final section there is added some information on contraception.

Altogether this is a useful little volume. The field of gonorrhœa in both male and female is well covered and due regard is paid to the important question of standard of cure. In the section on syphilis the chapter on pathological diagnosis is particularly good.

¹"Genius: Some Revaluations," by Arthur C. Jacobson; 1926. New York: Greenberg. Demy 8vo., pp. 160. Price: \$2.50 net.
²Read at a meeting of the New South Wales Branch of the British Medical Association on May 12, 1927.

¹"Venereal Disease: Its Prevention, Symptoms and Treatment," by Hugh Wansey Bayly, M.C.; Third Edition; 1927. London: Faber and Gwyer, Limited. Demy 8vo., pp. 242, with illustrations. Price: 10s. 6d. net.

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The Allied Sciences.

MEDICINE can scarcely be called a science. It is dependent on what has been termed the fundamental sciences of chemistry, physics, biology and botany. It may be regarded as a combination of many sciences applied to the subjects of health and disease. It is a science in so far as the diagnosis of disease, the causation of disease, the mechanism of the production of symptoms and the like are concerned. The practice of medicine is to some extent an art, although the skill of the medical practitioner should always be subsidiary to his professional knowledge. Bacteriology, protozoology, immunology and microscopy belong to medicine, although each is applied to purposes other than medicine. Veterinary medicine is dependent on practically the same sciences as is human medicine. Nursing relies on physiology, pathology and the general principles of medicine. Dentistry is merely a special chapter of medicine in which the mechanical aspect, the skill, is more prominent than the strictly scientific. Medicine extends toward the province of engineering and in its preventive aspects at all events there is some overlapping. There is no sharp dividing line between philosophy and medicine. The study of the mind in health and disease must encroach on the science of being, while psychiatry cannot be divorced from psychology, the science of conduct and the science of eugenics. In the past medicine has endeavoured to progress by herself, isolated and self-contained. She has shrouded herself with a veil of mystery and has sought the protection of superstition and the occult. Even today medicine is not innocent of sorcery. On the whole, however, medicine is advancing as a result of her frank recognition of cause and effect and her votaries are honest enough to seek aid from those who have studied the other sciences. It is highly

significant that our medical societies invite members of other professions to discuss problems of mutual interest. Medical practitioners, dentists, veterinary surgeons, engineers and pedagogues meet on common ground for the benefit of humanity. This movement is a healthy sign, but it must be extended and developed. The collaboration of the biochemist with the bacteriologist and morbid histologist has been an accomplished fact for a considerable time, but it is rare for a medical society to invite a prominent organic chemist to bring his science to the doctor of medicine. The physicist could be invited with benefit to meetings of medical practitioners, in order that the physical aspects of normal and abnormal functions of organs and tissues may be better understood. The mathematician, the zoologist, the botanist, the anthropologist and the archaeologist each have something to teach that would be valuable to medicine. It is not enough that individual workers in the laboratory and elsewhere seek the aid of these scientists. The need is present for an intimate contact between the ordinary member of the medical profession and members of other learned professions. In this way the important problems of disease will become familiar to those whose studies do not usually have reference to the human body, and the result of this contact would be a mutual broadening of vision and objective.

While the medical profession should seize every opportunity to learn from those competent to deliver valuable messages, it should realize that it in turn should impart knowledge to those in need of help. Medical practitioners are often in a position to advance the knowledge of stomatology and dentistry; they are the natural teachers of nurses; they can contribute useful information to veterinary surgeons. It is remarkable how few medical practitioners contribute original articles to the professional journals of dentistry, nursing and veterinary science. It is not suggested that articles on textbook matters should be contributed to these journals. Dentists, nurses and veterinary surgeons can read medical textbooks without outside assistance. But messages on the application of knowledge gained in medical practice to dental, nursing or

veterinary practice could be of the utmost value, if written in a scientific spirit. The spirit of conceit and the spirit of commerce must be excluded if these articles are to serve their proper purpose.

The collaboration between medical practitioners and those trained in other sciences should be encouraged at all times. If medicine is to continue to progress, it must be on the surest and most tangible foundations. In the existing order of things the man in medical practice, the clinician, collects some important information which is wasted because it cannot be coordinated with facts of a purely chemical, physical or biological nature. Special training is essential for the elucidation of the problems connected with disease, but it is a gross mistake to imagine that the medical practitioner is the sole one who possesses the ability to investigate such problems. The chemist is usually more competent to discover the nature of some altered physiological function than the medical practitioner, although it is the latter and not the former who can be trusted and recognized and measure the effect of such a change on the human subject. But few medical practitioners have made an intensive study of physics, chemistry, mathematics, geodesy, meteorology, ethnology or eugenics. In these days of accurate measurement and exact definition the medical practitioner has need for assistance from men accustomed to use instruments of precision and to express themselves in terms of meticulous accuracy. Collaboration in research and frequent contact in discussion are the two expedients which will lead to the advancement of knowledge.

Current Comment.

ALEUCHÆMIA LEUCHÆMIA.

THE name leuchæmia or white blood was first used by Virchow. The condition described by him had previously been named leucocythæmia by Hughes in 1845. The name leuchæmia implies an increase in the white cell content of the blood and in the vast majority of cases of leuchæmia a leucocytosis is present. Ehrlich's method of staining served to distinguish granular and non-granular leucocytes and he therefore divided leuchæmia into two forms, medullary and lymphatic. He held that the first was a disease of the bone marrow and the second a disease of the lymphatic glands. In

the course of time much work has been done on the manifestations of this disease and it has been necessary to recognize variations in the fundamental concepts. Thus it is known that patients with leuchæmia may manifest no leucocytosis as in the case reported in this issue by T. E. Green. These forms have naturally given rise to much discussion and not a little confusion has arisen in consequence. In the endeavour to understand these manifestations certain facts must be remembered. The number of leucocytes in the blood of a patient suffering from true leuchæmia may be normal or even subnormal. This may be due to several circumstances. Treatment by X rays, arsenic, benzol and so forth not infrequently result in a reduction of the leucocyte count. In fact several authors have laid stress on the necessity for care in treatment lest too great a reduction occur. Again intercurrent infections such as enteric fever, tuberculosis or septicæmia, may bring about a fall in the number of leucocytes. Moreover, in a certain number of leuchæmic patients there is an aleuchæmic phase and there remains a small group of patients in whom the clinical history and pathological findings are typical of true leuchæmia with the exception that as far as is known, leucocytosis has never occurred.

Aleuchæmic leuchæmia is of relatively rare occurrence. This is shown by an interesting report made by John T. King, Junior, in 1917 on one hundred and five cases of leuchæmia occurring at the Johns Hopkins Hospital. Forty-one patients suffered from the lymphatic and sixty-four from the myeloid variety. Of the patients in the first group five and of those in the second group nine were "aleucocythæmic" at some time or other. King gives details of three patients. One suffered from acute myeloblastic leuchæmia and as far as was known, at no time manifested a leucocytosis. Another patient suffering from chloroma, had a history of leucocytosis, but none was found when blood counts were made at intervals of several months. The third patient suffering from chronic aleucocythæmic lymphatic leuchæmia, manifested no leucocytosis prior to the terminal stage. In view of the fact that no gross hæmorrhage occurred in Green's patient, it is interesting to note that in the first of the three patients studied by King there were small cutaneous hæmorrhages in the left arm and in both retine. In the third patient no hæmorrhages were present. In discussing the condition, King states that in the small group of cases to which the name pseudoleuchæmia has been given by German writers, "the pathology is that of leuchæmia, except that the blood picture is normal," but that in many instances the condition passes into one of undoubted leuchæmia with characteristic blood changes. He points out that attempts to create a separate disease entity of pseudoleuchæmia have not met with general acceptance, as the difference between these conditions and leuchæmia is slight. King claims in his conclusions that the conditions classified by various authors as true pseudoleuchæmia, either lymphatic or medullary, as aleuchæmic lymphadenosis or myelosis and as aleuchæmic leuchæmia

are probably to be considered as leucæmia at an aleuchæmic stage. It has to be determined whether this conclusion is justified or whether some alternative explanation cannot be found for the peculiar manifestations.

It must be admitted at once that there are many records of the transformation of aleuchæmic or aleucocythæmic into typical leucæmia. Moreover the leucæmic manifestations are often accompanied by a reduction in the number of red cells. It is to be noted that Green's patient had a low erythrocyte count and hæmoglobin value. Other authors have emphasized the aleuchæmic phase of acute lymphatic leucæmia in infants and young children. The age of Green's patient was five years. This type of remission is analogous to the remissions which occur in that other disorder of the hæmopoietic system, pernicious anæmia.

In considering this matter it is necessary to go back to the primitive mesenchyme cell from which all blood cells are developed. This mesenchyme cell is the immediate forerunner of the primitive bone cell, muscle cell, cartilage cell and so forth as well as of a large cell of irregular shape, possessed of a single round or oval nucleus and of a reticulated internal structure. This cell which appears in the circulation, has been named by Ferrata the hæmohistioblast. The appearance and significance of this cell was discussed in these columns in May, 1925. It is when some interference with the production or destruction of these primitive cells occurs that the clinical conditions, such as pernicious anæmia or leucæmia, result. Since erythrocytes and leucocytes at this stage of their development are so closely related, it is easy to understand that anæmia frequently accompanies leucæmia. In the present state of knowledge no definite statement can be made beyond this in regard to the origin of leucæmia. Anything which goes further is pure conjecture.

The realm of conjecture must be entered with caution. It is safe to do so only when the hypothetical nature of the statements is remembered. In these circumstances it is interesting to recall the work of Aschoff on what he calls the reticulo-endothelial system and to consider its possible application to the question under discussion. Aschoff found that *intra vitam* staining by lithium carmine, pyrrhol blue, trypan blue and so forth results in the appearance of dye-stained granules in certain cells of the connective tissue series. In consequence he was able to distinguish these cells from most of the parenchymatous cells, from the ordinary blood cells, myeloid as well as lymphoid, from the leucocytes of the lymphatic glands and from the plasma cells and mast cells. He arranged the cells according to the fineness and compactness of the granules found on staining. He combined two of the groups of his ascending scale of cells and called them the reticulo-endothelial system. These cells include the reticulum cells of the splenic pulp, the cortical nodules and pulp cells of the lymphatic glands and ultimately of the lymphoid apparatus. He pointed out that these cells take the dye and

stain more deeply than the connective tissue cells, but that in the rapidity and intensity of the staining they fall far behind the reticulo-endothelial cells of the sinuses of the lymphatic glands, the blood sinuses of the spleen, the capillaries of the liver lobules (Küper's stellate cells), the capillaries of the bone marrow, the adrenal cortex and the hypophysis. He grouped all these cells together because of their common function of producing reticulum and of lining sinusoid blood and lymph spaces. He pointed out that the grouping was all the more necessary because of the faculty which these cells have of functioning simultaneously as lining epithelium and producers of reticulum. He holds that the newer views concerning the syncytial nature of the mesenchyme and the differentiation of the various fibre systems within the syncytium, the less differentiated parts of which can be detached to form independent cells, justify the conception of a system of reticulo-endothelial cells endowed with the faculty of exercising a multiplicity of functions.

The connexion of the reticulo-endothelial system with aleuchæmic leucæmia was suggested in 1926 by Tebbutt in an unpublished paper read before the Section of Pathology and Bacteriology of the New South Wales Branch of the British Medical Association. In discussing the pathological findings in a case of aleuchæmic leucæmia he pointed out that a tissue infiltration occurs in all forms of leucæmia. The infiltrating cells in the organs described by him were "mononuclear cells of a peculiar type, not definitely recognizable in sections stained by hæmatoxylin and eosin as any type of leucocyte." They were certainly not small lymphocytes and he doubted whether they were large lymphocytes. He thought that they were possibly more primitive cells, myeloblasts or lymphocytes and that they entered the circulation in the tissue of production and left it elsewhere because they were not true leucocytes, but wandering cells derived from fixed connective tissue cells of the reticulum of the lymph glands, the spleen *et cetera*. In other words they belonged to the reticulo-endothelial system of Aschoff. Further details of Tebbutt's findings and of the possibilities suggested by him need not be given. It is sufficient to show that there are good grounds for supposing that the reticulo-endothelial system may share in the production of aleuchæmic leucæmia. Its share in the process may be by a mechanism different to that suggested by Tebbutt. Apart from this it is to be noted that Aschoff alludes to the possibility of a histiocytic or monocytic leucæmia.

We have asked the question as to whether the view is justified that an aleuchæmic leucæmia always manifests a leucocytosis at some stage. In view of the fact that reasonable grounds exist for the belief that it is possible for the aleuchæmic manifestations to continue throughout the illness and since cases have been described in which no leucocytosis has been found, the onus must be on those who claim that a leucocytosis always occurs. In the further investigation of this question intensive study of the type of cell by vital staining and its distribution throughout the body will be necessary.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Typhoid Vaccination by Mouth.

VICTOR BURKE AND LA VERNE BARNES (*Journal of Infectious Diseases*, July, 1926) describe experiments undertaken to determine whether typhoid proteins are absorbed from the digestive tract as evidenced by the appearance of agglutins and whether vaccination by mouth is as effective as the subcutaneous method. A rabbit which received nineteen doses of standard typhoid vaccine (one hundred and forty cubic centimetres of two thousand million organisms to one cubic centimetre) had the agglutinin titre of serum raised from one in twenty to one in five thousand. Subcutaneous vaccination was found to be more effective than vaccination by mouth.

A New Method for Histopathological Examination of Sputum.

J. A. PASCUAL (*Boletín Tecnico de la Direccion General de Sanidad*, January, 1927) describes the following technique for histopathological examination of sputum. The patient voids his morning sputum into a freshly prepared solution of nitrate of uranium one gramme, water one hundred grammes, "Formol" (Merck) fifteen to twenty cubic centimetres. This is frequently agitated and changed at the end of about four hours. The sputum so treated is formed into solid masses. Subsequent procedures vary according to whether the mass is to be sectioned after freezing or embedded in celloidin or paraffin. Different methods of staining are described, each possessing its special advantages for demonstration of cellular constituents, bacteria or connective tissue or other histological features of the sputum. The masses when not sectioned can be indefinitely preserved as laboratory specimens. Finally it is pointed out that this is an easily managed aseptic method of dealing with sputum and is of great value in rendering sputum suitable for transmission to a distance when no laboratory facilities are at hand.

Immunization by Vaccines and Sera.

A. BESREDKA (*Seuchendekämpfung der Infektionskrankheiten*, Heft 1, 1927) maintains that most infective diseases can be treated by vaccine therapy either orally or subcutaneously. As an example of its prophylactic use he mentions an outbreak of typhus fever in which 7.7% of those uninoculated became ill as compared with 2.2% who received subcutaneous injections of vaccine, and 0.17% of persons to whom it was given orally. Similar results followed an outbreak of dysentery among the Versailles garrison. He considers that oral adminis-

tration is of most service with diseases affecting the gastro-intestinal tract. Not only is the resistance against the coliform group greatly raised, but in addition that of the genito-urinary tract is affected. For all staphylococcal infections of the skin and mucous membranes he advocates the use of applications of serum. When applied as a dressing it speedily relieves pain, reduces congestion and prevents the formation of pus as well as scarring. If the abscess has opened, the serum should be injected into the cavity or else the cavity should be packed with gauze strips soaked in the serum. Good results have followed this method of treating boils, whitlows and mastitis. Besredka considers that better results would follow gastric operations, if all surfaces as well as dressings and sutures were dipped in the serum prior to use. For these cases a polyvalent serum is essential. An autogenous serum can be prepared for such patients as can wait for its preparation.

Method of Staining Bacterial Flagella.

P. H. H. GRAY (*Journal of Bacteriology*, October, 1926) describes a method of staining bacterial flagella which gives more certain results than any other standard method tested and possesses the advantage that very little precipitate remains on the film surrounding the bacteria. The best results are obtained with twenty-four hour to three-day old agar slope cultures on nutrient agar or some other medium suited to active growth. Suspensions are made in sterile distilled water in a watch glass and left for twenty to thirty minutes at room temperature during which time the organisms, if active, will be washed clean. They should be examined for motility in the fresh state immediately before the film is made. A very thin film is spread on a clean slide and dried quickly. The mordant used consists of the following two solutions: First, a saturated aqueous solution of potash alum, five cubic centimetres; tannic acid, 20% aqueous solution, two cubic centimetres; mercuric chloride, saturated aqueous solution, two cubic centimetres; second, a saturated alcoholic solution of basic fuchsin. For use 0.4 cubic centimetre of the fuchsin solution is added to the first solution. After being well mixed a precipitate forms. The solution must be freshly mixed for each batch of slides and then 0.5 cubic centimetre is allowed to act on each slide for ten minutes at room temperature. The solution is washed off with a gentle stream of distilled water and when no more fine precipitate is removable, a few drops of Ziehl's carbol fuchsin are applied and left for five to ten minutes. The slide is then washed.

Antibody Response After Immunotransfusion in Malignant Endocarditis.

KATHERINE M. HOWELL, BERNARD PORTIS AND DOROTHY BEVERLEY (*Journal of Infectious Diseases*, July, 1926)

relate the history of a patient with acute bacterial endocarditis treated with immunized blood. On three occasions blood cultures from the patient yielded two types of colonies of streptococci, one small moist dark-green, the other small moist hæmolytic. The hæmolytic colonies yielded fine long-chained streptococci in films, the green colonies yielded large short-chained streptococci. Neither was bile-soluble. Vaccines were prepared separately with these organisms and donors were immunized with repeated injections. Immunization as measured by agglutinin titre was obtained within two weeks. The immune blood was given by direct transfusion in two hundred to three hundred cubic centimetre amounts. Twelve transfusions, extending over a period of five months, were given. Before transfusion the patient's serum did not agglutinate the streptococci isolated and the opsonic index was 0.57. Three days after the final transfusion the opsonic index was 2.5 for the green streptococcus and 0.3 for the hæmolytic strain, while the serum had an agglutinating titre of one in 5,120 for the green streptococcus and one in 20,480 for the hæmolytic streptococcus. The patient's condition improved almost immediately after transfusion, the improvement lasting seven to ten days. As his symptoms became worse, an accompanying drop in antibody titre occurred. When immunotransfusion was started the patient's symptoms were so severe that death was expected momentarily, but life was prolonged for five months. The authors suggest that in a subacute condition a cure might be effected.

Cultural Methods in the Examination for Amœbic Parasites.

CHARLES F. CRAIG AND J. H. ST. JOHN (*American Journal of Tropical Medicine*, January, 1927) state that they have found cultural methods superior for diagnostic purposes to either sedimentation method or direct examination of faeces in searching for the presence of amœbæ. Thirty-nine out of seventy-one individuals examined yielded one or more species of amœba with cultural methods of which eleven or 15.49% were *Entamoeba histolytica*. They obtained most satisfactory results with normal-salt-serum medium (seven parts of normal saline solution to one part inactivated human blood serum).

HYGIENE.

The Ventilation and Heating of Factories.

H. M. VERNON AND T. BEDFORD (*The Journal of Industrial Hygiene*, February, 1927) describe an investigation of factory ventilation and heating made by them in England. The inquiry lasted two years and systematic observations were made both in summer and winter at twelve up-to-date factories. There is a sharp conflict of opinion concerning the relative merits of natural and artificial ventilation and the difficulty of the prob-

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lem is increased by the fact that a given system which is found suitable for one country, is not necessarily applicable to another country where the atmospheric conditions are different. In England with its mild climate it is possible to ventilate large factories excellently by means of windows with the occasional use of artificial extraction. In the heating of factories it is important that the source of heat should be as near floor level as possible in order to reduce the temperature gradient to a minimum. Thereby the feet of the workers are kept relatively warm and their heads relatively cool, while there is an enormous saving of heat. Systems of heating by overhead steam pipes are radically wrong, for the larger portion of their heat ascends to the roof and is wasted, while only a small portion reaches the workers below and even then it reaches their heads rather than their feet. The real significance of various systems of ventilation and heating must be sought in their influence on the health and efficiency of the workers who have to experience them. Information on this subject was obtained from observations made on eight hundred and nine women and girls employed in six workrooms at a canister factory. On an average the amount of time lost in the different rooms varied from 1.47% to 2.05% of working time. The time lost appeared to depend more especially on the temperature of the air, for it was nearly the same in rooms which had a temperature of about 16° C. in winter and 20° C. in summer. Taking the mean loss of time in these rooms as a standard it was found that in another room which was 4° colder than the average in winter the sickness showed a 21% excess, while in yet another room which was at all times about 4° warmer than the average, a 32% excess was manifest. It appears that a medium temperature is best for health and that a departure from it in either direction tends to cause increased illness.

The Minimal Lethal Dose.

W. W. C. TOPLEY (*The Journal of State Medicine*, February, 1927) in the second of the Harben Lectures, 1926, is of the opinion that the definition of a minimal lethal dose of diphtheria toxin as "the least amount of toxin which will kill a guinea pig of two hundred and fifty grammes in four days" is a nonsense-definition. The fault in wording which renders the definition verbally nonsensical is its reference to an isolated observation instead of to an average result. If the definition of the minimal lethal dose of a toxin or culture is expanded to "the least amount which will cause a 50% mortality among an adequate sample of test animals under certain standard conditions," it must also be known how this percentage mortality is affected by varying the dose in either direction from the particular value which is associated with the death of half the test sample. The contrast between the living cultures and the bacterial toxins is evident. In

the case of diphtheria toxin, halving the dose serves to reduce the mortality from 100% to zero. In the case of *Bacillus erythraeus* a millionfold decrease in dose suffices only to lower the percentage mortality from 98.8 to 28.2. The unavoidable conclusion is that, in the case of any bacterium which causes death as the result of a progressive multiplication within the tissues, no such quantity as an average lethal dose can in practice be determined with sufficient accuracy to be of any scientific value. In any determination of a standard lethal dose no death, due to the toxæmia or infection under investigation, must be ignored. To compare the lethal power of two different strains of a particular bacterial species, the observer may in the case of each strain attempt to determine the minimal lethal dose for a particular species of test animal and may then express the result of the comparison in terms of the ratio between these doses or he may take two samples of animals and give each animal of each sample the same dosage of bacteria and compare the resulting mortality in the two samples. As a variant of the latter procedure the observer may vary the dose over a similar range within each sample and compare the total proportional mortality in the two samples, thus grouping together the effects of doses of different size. The author concludes with a discussion of a series of experiments undertaken to determine the relative epidemicity of different strains of the same bacterial species. Included under the term "epidemicity" are those bacterial characters, whatever they may be, which enable a parasite to spread rapidly among a population at risk and to give rise to large numbers of cases of disease within a short interval of time.

Destruction of Mosquito Larvæ.

S. AND E. DEBUEN (*Boletín Técnico de la Dirección General de Sanidad*, March, 1927) record the results of their early experiments with Paris green in the course of the antimalarial campaign. They chose samples of Paris green containing 55% of arsenious anhydride. In laboratory experiments they used one part of this to one hundred parts of wood ashes. This mixture was strewn on the surface of vessels which contained larvæ of *Anopheles* and *Culex* and some small fish. In about three hours the *Anopheles* larvæ were dead, while at the end of six hours the fish and the *Culex* larvæ were uninjured. The water from the vessels was given to a young pig which manifested no ill-effects from its consumption. In field work the most satisfactory mixture was found to be one part of Paris green to one hundred parts of road dust finely sieved. This was scattered over the surface of the water treated either by hand or by a special apparatus. With reasonable precautions no bad results accrued to those employed in the work. Counts of the *Anopheles* larvæ before and after the experiments revealed diminution in numbers of from 48% to 97%. Stock drinking at the

streams and pools, manifested no symptoms of arsenic poisoning. Comparing petroleum with Paris green, the authors state that the former is much more expensive and does not work well in the presence of aquatic vegetation. On the other hand it destroys the nymph stage of *Anopheles* and also the larvæ of *Culex*. Paris green is two hundred and sixty-six times cheaper per superficial unit of water treated and acts even in the presence of dense aquatic vegetation. It kills only the larvæ of *Anopheles* whilst the *Anopheles* nymphs and *Culex* are unaffected.

The Prophylaxis of Scarlet Fever.

J. VON BOKAY (*Wiener Medizinische Wochenschrift*, January 15, 1927) relates his experiences with the Dick test. After carrying out 7,431 tests he agrees with its value, especially in the prophylaxis of scarlet fever. In 729 cases active immunization was carried out with gradually increasing doses and 90% of the patients subsequently failed to yield a reaction. He agrees with various American authorities that this immunity will probably last three years. Complications have been very mild in character and of short duration. Occasionally pyuria was noted after the injections. Only one patient in the series contracted scarlet fever of a mild type.

The Prevention and Control of Rheumatoid or Atrophic Arthritis.

L. L. LLEWELLYN (*The Journal of State Medicine*, March, 1927) states that the prevention of chronic rheumatism constitutes a public health problem of prime magnitude. To handle the problem effectively the vicious habit of dwelling only on the end results of the several disorders grouped under chronic rheumatism must be corrected and more attention concentrated on those minor deviations from health which are the forerunners of these various affections. In rheumatoid arthritis the efforts at prevention must begin at an early stage, namely prior to the advent of joint swellings. This entails timely recognition of the premonitory symptoms, notably the vasomotor or the Raynaud phenomena. Given their presence, steps should be taken at once to remove local infective foci or to correct alimentary derangements. Simultaneously any signs of endocrine imbalance call for tentative thyroid therapy, especially in the presence of symptoms of Raynaud's disease. Steps should also be taken to correct the lowered sugar tolerance by adjustment of the carbohydrate "load" aided by the vasodilator drugs. To correct the widespread vasomotor instability courses of hydrotherapy to restore normal vascular tone should be undertaken. The geographical and clinical overlapping of rheumatoid arthritis, endemic goitre and exophthalmic goitre is worthy of more intensive study as there is much and increasing evidence of some deep-seated kinship between these disorders and this is doubtless born of still deeper-seated aetiological affinities.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, on June 23, 1927, Dr. F. BROWN CRAIG, the Acting President, in the chair.

Pyelitis.

Dr. E. H. M. STEPHEN read a paper entitled: "Pyelitis in Children" (see page 142).

Dr. F. BROWN CRAIG read a paper entitled: "Pyelitis Complicating Pregnancy" (see page 143).

Dr. R. K. LEE BROWN read a paper entitled: "Pyelitis" (see page 145).

PROFESSOR J. C. WINDEYER thanked the three authors for their excellent papers. He had been more interested in that of Dr. Craig on pyelitis in pregnancy. In discussing the question from the bacteriological point of view he was in entire agreement with the views expressed in regard to the great number of types of organism concerned in the process; the *Bacillus coli communis* was not the only organism involved. He had been interested in the remarks about focal sepsis in other parts of the body and thought that possibly this factor had not been sufficiently recognized as far as pregnancy was concerned. He had recently been investigating the question of puerperal sepsis and had found that an enormous number of organisms of different kinds might be present in an infected uterus. It was never possible to point to one variety of streptococcus or staphylococcus as being responsible for an infection. It was small wonder that vaccines did not produce the effects which might be expected of them. He had been interested in the use of vaccines in pyelitis fifteen or twenty years previously. In those days they had not known of the good effect of large doses of alkali. In a series of patients at the Royal Hospital for Women the majority had aborted or had had abortion induced before the vaccine was given. In those days more serious and more acute forms of pyelitis had been encountered, because they did not know how to treat them. He was gratified to hear Dr. Brown Craig's assertion that 70% of the patients recovered without the expert assistance and apparatus of the urologist. He thought that emphasis should be laid on the fact that treatment by alkalis would produce such good results. The question of the differential diagnosis of pyelitis from acute appendicitis, as raised by Dr. Brown Craig, was of importance. A mistake was easily made. He had had experience of this difficulty in many cases at the Royal Hospital for Women. It was his experience that in pyelitis there was nearly always a tender spot in the costo-vertebral angle which would give rise to the suspicion of pyelitis. When the urine was tested this suspicion would be confirmed.

Dr. M. J. PLIMLEY expressed his appreciation of the papers and especially of the way in which Dr. Lee Brown had discussed the various paths of infection. The diagnosis of pyelitis in children under two years of age was often extraordinarily difficult. Especially in female babies it was not easy to collect a specimen of urine. The child might have all the appearance of suffering from gastro-enteritis or from appendicitis. He had seen babies with pyelitis whose condition resembled that seen in pneumonia; with the high temperature they frequently manifested a "catchy" pneumonic type of breathing. He had seen one baby with tenderness in the costo-vertebral angle. It had been decided to wait until the following day to allow of urine examination. At operation a retrocaecal, acutely inflamed appendix had been discovered. He had used vaccines and had come to the conclusion that they were of help in preventing toxæmia, but that as far as cure was concerned good results were not obtained. He asked whether it was not possible that the pyelitis of pregnancy was due to the lighting up of an old pyelitis of childhood. Many children were not cured of their pyelitis and a relapse or lighting up of the condition often took place.

Dr. S. HARRY HARRIS said that they had heard three interesting papers. He would make more particular reference to that of Dr. Brown Craig. Personally nearly fifteen years previously he had done a good deal of research in *pyelitis gravidarum*. The condition, as a series of pyelograms had shown, generally started as a hydronephrosis which in the majority was secondary to a kinking of the ureter about two and a half centimetres above the brim of the pelvis. The blocking took place at the point at which the ureter crossed the tendon of the *psoas minor* muscle. The posture of the pregnant woman tended to put this muscle on the stretch. Dr. Harris felt certain that many cases of *pyelitis gravidarum* were caused in this way.

Dr. Harris went on to say that it was not sufficiently realized that *pyelitis gravidarum* and pyelitis of the puerperium were essentially different diseases. It was, of course, possible that pyelitis of pregnancy might be carried on into the puerperium. Pyelitis beginning in the puerperium, however, was a different and much more serious disease. The lesions found were generally of the nature of multiple septic renal infarction and were almost invariably bilateral, it was acute and often fatal and was not amenable to cystoscopic treatment. He had seen many patients affected in this way. The first case of this nature in his experience had been that of a patient who had lived for six months with a hepatic temperature and had then died. Another patient had been seen with the late Dr. Litchfield. The patient had been in hospital with proved bilateral disease for four and a half months with fever and frequent rigors and had recovered. After twelve years the patient was still well.

In regard to the advanced cases of pyelitis mentioned by Dr. Brown Craig, complicated by perinephritic abscess, peritonitis and so forth, he held that these were not cases of *pyelitis gravidarum*, but of advanced kidney disease complicating pregnancy. To illustrate this Dr. Harris referred to a patient whom he had seen with Dr. James Hughes in the twenty-eighth week of pregnancy. A big mass had been present in the right loin, accompanied by severe pain and high temperature. The lesion consisted of a tuberculous kidney with a perinephritic abscess. The treatment had been nephrectomy. The patient had recovered and the wound had healed practically by first intention. The patient had gone to term and had given birth to a healthy living child. Numerous other examples could have been quoted, had time permitted.

Dr. Harris disagreed with Dr. Brown Craig that the viewpoints of urologist and obstetrician were essentially different. The object of each should be the welfare of mother and child; it should be possible for them to take a broad view of the condition. Dr. Craig had also suggested the use of the prone position in pyelitis. Dr. Harris thought that the left lateral position was more tolerable than the prone position. Dr. Harris thought that the first method of treatment to be tried should consist of postural measures and alkaline therapy. If the patient did not respond then there should be no hesitation in subjecting the patient to cystoscopy. There was no risk and practically no difficulty. The only difficulty would be in the presence of wide separation of the ureters. If the best results were to be obtained, it would be useless to use anything smaller than number 10 catheters. With the ordinary ureteral catheters (numbers 4 to 7) results were uncertain. It was not uncommon in passing a large catheter to find that when the site of the obstruction was passed, a sudden gush of purulent urine occurred almost as though a tap had been turned on. When the catheter was passed it should be retained for as long a time as the patient would tolerate it, frequently for three or four days. It was important, however, that the catheter should be kept draining all the time. For all that the condition was a troublesome one to treat and demanded a good deal of attention from both the urologist and the other attendants.

Pyelitis gravidarum rarely affected the left kidney alone. If the left kidney alone were involved, it would most likely be found that some other gross renal lesion was present, such as hydronephrosis, tuberculosis or stone. He had seen only one patient submitted to catheterization who had not been relieved in twenty-four hours. In this instance the condition had not been a true *pyelitis*

gravidarum, but a double hydronephrosis. Dr. R. I. Furber had performed Cæsarean section and the patient had recovered. Dr. Harris had later performed a right nephrectomy.

His experience in regard to streptococci, staphylococci and the *Bacillus coli communis* did not coincide with that of some American urologists as described by Dr. Lee Brown. In his experience cortical septic infarcts were most often due to the *Bacillus coli communis*. He was sure that the virulence of these organisms in Australia was different to that found in America. So too the operations done in America for genito-urinary tuberculosis and their results were quite different from those obtaining in Australia, chiefly, he thought, because of the difference in virulence of the organisms.

In conclusion Dr. Harris discussed some of the drugs used in the treatment of pyelitis. His experience of acid sodium phosphate, particularly in prostatic diseases, was that the more the drug was given, the more alkaline the urine became. Sodium benzoate was better. He had tried calcium chloride, but had found that it invariably caused obstinate constipation. "Hexyl-Resorcinol" in his experience was costly and disappointing. He had found it did nothing that hexamine would not do better.

Dr. R. J. SILVERTON said that it was necessary for the medical practitioner called to see a patient with pyelitis, to take a broad view of the situation. Pyelitis was an incident in pregnancy and nothing more. It was always desirable to endeavour to make the patient "carry on" by means of medical treatment, but when the patient was very ill, had excessive fever and was losing weight, it was necessary to use the cystoscope. In the large majority of cases it would be found that when the catheter was about half way up the ureter, urine would begin to flow with rapid drops and sometimes, even with a continuous flow. It was his practice to use a number 6 or a number 7 catheter and to leave it in for three or four days. He found that the temperature remained down while the catheter was *in situ*, but that when the catheter was removed the temperature went up again. It was not necessary to use lavage, the only requirement was drainage. He had frequently had to desist from use of the catheter and had found it necessary to recommend induction of labour. Patients treated in this way often went through a subsequent pregnancy without any difficulty, so he thought that the catheter probably did good. In regard to the diagnosis of kinks of the ureter in pregnancy, he was averse to pyelography. He thought that the best results were obtained by inducing premature labour. The renal investigation could then be made at a later date. Dr. Silvertown then entered a plea for the use of greater discrimination in the medical treatment of pyelitis. He deprecated strongly the prolonged use of drugs, vaccines and of the pernicious habit of washing out the bladder. He had known patients to be subjected to this treatment for as long as two years. If a pyelitis persisted for more than a reasonable time, a thorough investigation should be undertaken. A young man had consulted him and had complained of some scalding of micturition and of pus in the urine. He had had no renal symptoms. Urological examination had disclosed an infected hydronephrosis which could be cured by nothing but nephrectomy. The term pyelitis was often used incorrectly, it was loosely used as a generic term and had hypnotized the medical practitioner's judgement. As there was such a procedure as pyelography, it should be recognized that an infected urinary tract should be given the benefit of innocuous procedures. There was a difference between pyelitis and pyelonephritis. For the purposes of actual practice, however, it was well to regard an infected kidney which excreted indigo-carmin normally, as being affected by pyelitis and one in which excretion of the dye was delayed, as being affected by pyelonephritis.

In discussing the intravenous use of mercurochrome, Dr. Silvertown admitted that many men, especially in America, held that in the presence of a gross lesion such as a kink, it was necessary to correct the abnormality first. At the same time he thought that it was essential to gain the upper hand of an infection by local procedures before much good would result from any form of drug treatment. Thus if a 1% solution of mercurochrome were given at the outset, good results would often be obtained, but not always.

Dr. R. I. FURBER agreed that there was a mechanical basis for pyelitis, but that the situation of the block needed consideration. Ordinary large tumours of ovaries or uterus did not cause hydronephrosis and consequent pyelitis by direct pressure between themselves and the posterior abdominal wall. As a matter of fact the hollow viscera as a rule were extraordinarily tenacious of their patency, although subject to considerable pressure from such tumours. However, hydronephrosis commonly occurred in connexion with tumours affecting the course of the ureters in the base of the broad ligament, such as cervical fibroids. A similar process of distortion of the course of the ureters went on in pregnancy as they were widely separated and lifted up by the growing uterus. He felt that this was the usual site of the primary block and he had a specimen of the full term uterus demonstrating complete bilateral hydronephrosis.

He knew that Dr. Harris's findings were absolutely correct, but thought that the dilatation above the *psaos minor* might be due to the fact that the ureters were better supported in their close attachment to the pelvic peritoneum. The results of treatment for pyelitis at the South Sydney Women's Hospital had been more fortunate than those recounted by Dr. Craig and Professor Windeyer, as he had not found it necessary to induce abortion.

He thought that cystoscopic diagnosis and treatment should be left in the hands of the urologist, considering that the man who could only dabble in cystoscopy was not in a position to give an authoritative opinion.

Dr. L. R. PARKER said that he rose to speak from the general practitioner's point of view. He agreed with Dr. Plomley that the diagnosis of pyelitis was a matter of extreme difficulty in young female children. At Greycliffe they were frequently unable to demonstrate the condition, but when a child was really ill, when no abnormality was demonstrable in the chest and when the intestinal condition was not sufficient to account for the symptoms, the child was generally regarded as suffering from pyelitis and treated accordingly. He thought that the same procedure would hold good in private practice. He asked whether there might not be an epidemiological or infective aspect to pyelitis. He had found in his own practice that he saw quite a number of patients with pyelitis apart from pregnancy in the months of February, March and April and that none appeared later in the year. He also had had these interesting experiences. A female patient had suffered from pyelitis when her next door neighbour had become similarly affected the following week. In the same district at the same period another female patient had developed pyelitis; a nurse had been installed and within four days the nurse had manifested pyelitic symptoms! In regard to vaccines, he had used autogenous vaccines for a number of years, but did not feel that they had definitely benefited a single patient. He had used alkalis and had found them efficacious. He also used so-called urinary antiseptics in combination with the alkalis, for a general practitioner must fire all available shots into the enemy's camp. Some antiseptics were active only in an acid urine, but others according to their manufacturers were active in both alkaline and acid urine. If it were not so, the practitioner could only blame the manufacturer for telling lies about his preparation. These at any rate were the type that he used. Patients generally liked to have ocular demonstration of the condition from which they were suffering. He had adopted the expedient of having three or four glasses displayed on the mantelpiece in which the pus could be clearly seen as it settled. He always found that as the condition improved the supernatant urine gradually changed from a sad-looking fluid to the normal bright amber colour and this optical demonstration generally served to encourage the patient. It was necessary to test the urine for pus regularly, however, and not to be content with macroscopical appearances. In one instance in his early practice the deposit had persisted in appearing, although the patient felt well and wondered why the medical attendance was continued. On examining the deposit, he had found to his surprise that it consisted of pure phosphates which had gradually replaced the pus. Dr. Silvertown had said something about patients being attended for two years and being treated for that time with drugs and vaccines. He had never found anyone who liked him sufficiently to put up with his treatment

for that length of time and he expected he would be a very old man before he discovered such an individual. He agreed with the spirit of Dr. Silvertown's remarks and thought that if the patient did not respond to medicinal treatment after four or six weeks at the outside, he should be examined by a skilled urologist. He had nothing but good to say of the urologists. He had recently sent three patients to a urologist and all had been promptly cured.

Dr. H. A. RIDLER thanked the three speakers. He agreed that the pyelitis seen in earlier years was more severe than at the present time. It was rarely necessary to induce labour in either of the hospitals to which he was attached. His experience of the puerperium was that when infarcts occurred the condition was generalized. It was a pyæmia rather than a pyelitis.

Dr. R. H. BRIDGE showed several skiagrams which were of interest. One served to illustrate the results of prolonged treatment on a false diagnosis. The patient had been treated for so-called pyelitis. A dense stricture had been present with a hydronephrosis. Dilatation had been performed on several occasions, but with no improvement and it had been necessary to perform nephrectomy. Another demonstrated a stricture of the ureter which had disappeared on dilatation. Another was from a patient suffering from chronic pyelitis of pregnancy. The ureters were tortuous and dilated and no improvement had occurred after the confinement. He recalled two instances in which he had found it necessary to recommend induction of labour. One had been similar to that described by other speakers. The patient had remained comparatively well as long as the ureteric catheter was kept in position in the ureter. When the catheter was removed the symptoms returned and induction had perforce been undertaken.

Dr. A. J. GIBSON discussed the question from the point of view of the antenatal clinic. He was interested in the point raised by Dr. Harris that hydronephrosis was a common precursor of an attack of pyelitis. He had frequently seen patients in the antenatal clinic with pain in the costo-vertebral angle and tenderness on bimanual palpation of this region, in whom he suspected slight hydronephrosis, but whose urine frequently manifested no gross changes. These patients sometimes later manifested turbidity of the urine and sometimes became affected by pyelitis, if the condition was neglected. After confinement it would be possible to overlook involvement of the kidney, if a catheter specimen of urine was not examined. In regard to drugs he advocated citrates and thought that hexamine was dangerous and sometimes caused a lighting up of the trouble. He had tried sodium benzoate, but had had most success with boric acid given in doses of 0.6 gramme (ten grains) in the later stages. If conservative treatment was being adopted, it was necessary to submit the patient to X ray examination, otherwise renal calculus might be missed.

Dr. E. H. M. STEPHEN said that he had only a little to add to what he had already said. He wished that all practitioners of medicine would consider the possibility of pyelitis in all cases of "pyrexia of unknown origin" in children. The prognosis in acute pyelitis was good, whereas in chronic cases it was so much less good that this step should result in much benefit to the community.

Dr. LEE BROWN, in reply to Dr. Silvertown, said that if possible any local focus that was present should first of all be removed. In his paper he had referred to the intravenous use of mercurochrome before a local focus was removed. He had intended this to refer only to those patients who were in imminent danger of death unless something was done for them, when the body immunity had as it were "given up the ghost" and organisms were breeding *ad libitum*. In these circumstances mercurochrome was quite wonderful and the patient previously mentioned to whom this had been given, would have undoubtedly have died without it. He did not think that there was any justification for Dr. Parker's suggestion in regard to epidemics.

In regard to the question of septic infarcts of the kidney raised by Dr. Ridler, he said that unless the organism causing a septicæmia were overcome by phagocytic activity, the only path for elimination of the microorganisms was by the kidneys. When the renal circulation was considered it would be seen that the kidney was especially prone to infarction. All the arteries of the kidney were

end arteries. There were no anastomoses. An embolus set free in the blood stream generally lodged in a terminal branch of an interlobular artery. When an end artery was blocked it meant that the whole area supplied by that artery would be cut off from blood supply. It was impossible to reverse the renal circulation. Fluid passed through the arteries of a kidney removed *post mortem* would appear at the veins. Fluid put into the veins, however, would not go beyond the efferent glomerular plexus. An acute pyelitis would generally clear up with forced fluids, rest and alkalis. He did not think that there was any value in urinary antiseptics. Hinman had shown that the amount of hexamine that was required to produce any antiseptic action, would damage the functional power of the kidneys. As for "Hexyl-Resorcinol" it was prone to cause indigestion and had little effect on the urine. He considered it very difficult to procure an autogenous vaccine. If a pyelitis persisted, it was best to look for a mechanical condition causing back pressure and remedy it.

Dr. F. BROWN CRAIG, in reply to Professor Windeyer, said that he still believed in vaccines for chronic forms of pyelitis. Whether the good effect produced was due to a protein shock or not he could not say. He thought with Dr. Plomley, that it was quite likely that the pyelitis of pregnancy might be a lighting up of an old pyelitis which had originated in childhood. The pyelitis would not arise on account of the pregnancy, but in an area of lowered resistance which was affected by a physiological condition. He was glad to hear Dr. Harris's criticism. He had read Dr. Harris's early papers and recognized that his work had done much to clarify their ideas in cases in which obstruction of the ureter existed. The pyelitis of the puerperium in his experience had not always been of the acute variety described by Dr. Harris. He frequently found that the pyuria vanished with the disappearance of the pyrexia without going on to pyæmia. He had made his remarks about urologists taking their view from the renal field after reading articles in the recent urological and radiological journals. These articles were written by men who had no interest in pregnancy, but only in ureteric deformities and disabilities. One author had advised catheterization and kidney lavage for all forms of pyelitis of pregnancy—a line of treatment which seemed to him quite unjustifiable. He was glad to hear that urologists in Sydney took a saner view. In reply to Dr. Silvertown he said that the first duty of the medical practitioner was to tide the patient over until the end of the pregnancy and then to investigate the urinary condition with the help of the urologist.

In reply to Dr. Furber and his suggestion that kinking might occur lower than the brim of the pelvis as a result of previous inflammation, he pointed out that the pelvic cellular tissue did not return to its previous normal condition after inflammation. Scar tissue formed and this was a possible cause of subsequent increased tension and dragging upon the ureter. He did not think that the obstetrician should be debarred from using the cystoscope for diagnostic purposes. Personally he found it a most useful addition to his armamentarium. He had been interested in the histories mentioned by Dr. Bridge and agreed with his practice that when toxæmia was increasing pregnancy should be terminated in order to save life. He agreed with Dr. Gibson that right-sided pain was a common incident in the antenatal clinic. The presence of an uninfected hydronephrosis was a possible explanation of that pain. If there was any suspicion of bacilluria he thought that a bacteriological examination of the urine should be made. It was not always possible to do this in hospital patients, but he always insisted on it in dealing with private patients. If a bacilluria existed, he continued to use autogenous vaccine until term or even into the puerperium.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in the Medical Society Hall, East Melbourne, on June 28, 1927, Dr. J. NEWMAN MORRIS, the President, in the chair.

A Mission to America.

Dr. STANLEY ARGYLE, M.L.A., gave an address on "Experiences in America, Grave and Gay." The address was illustrated by numerous lantern slides.

Dr. Argyle said that the mission to America, consisting of Professor R. J. A. Berry, Dean of the Faculty of Medicine, Mr. J. Love, the secretary of the Charities Board, and himself, had been misunderstood in many quarters. They had gone, not to ask for money from the Rockefeller Institute, but to study at their suggestion and with their cooperation the problems of hospital administration and medical education. He thought that, if a medical centre were established in Melbourne on lines approved by the Rockefeller Foundation, it might render financial assistance; this depended very largely on how much they in Melbourne were prepared to do first. They had been very much indebted to the American Medical Association, the American College of Surgeons, the Rockefeller Foundation, the American Hospitals Association and other medical bodies for the hospitality they had received, and for the care and trouble they had taken to place all the information they could before them and to insure that in the short time at their disposal they could see as much as possible.

He had been impressed by the large amount of research work being conducted in America. Although the immediate results of this work might appear to be slight, yet the information obtained when collected and pieced together might prove to be of the greatest value.

The average length of the medical course in America was four years, but the subjects taught in Melbourne in the first year were there delegated to the pre-medical schools. One year of internship was often insisted on before a graduate could start in practice and after that a State medical examination had to be passed. This examination, however, was not of much value as a candidate who possessed the diploma of one of the recognized schools was rarely if ever rejected.

In Australia any student possessing the necessary qualifications might enter a university as a medical student. In America each medical school had a fixed number of vacancies and application had to be made for admittance. In one school out of two hundred and fifty applicants only fifty had been selected. The selection of students was undertaken by a board consisting of the Dean of the Faculty and two others who took into consideration the scholastic record, native ability, character, personality and inclination of the applicant to devote himself to the study of medicine.

The Mayo Clinic was a monument to the ability and enterprise of two men. All patients came for diagnosis to the clinic, which was connected to all the surrounding hotels and hospitals by subways beneath the streets. A wonderful amount of thought had been given to post-graduate study and numerous scholarships had been established for its furtherance.

The Cook County Hospital which was financed from the rates, was the largest and also one of the worst hospitals he had seen. The members of the staff were all public servants and could not be easily dismissed by the superintendent. With a change in political administration the whole staff might be changed.

In the past decade a great change had taken place in the aspect of medical education in America. In the past there had been a large number of poor and mediocre medical schools, some of them privately owned and managed largely for financial gain. These had practically all been abolished. The whole of America had adopted the policy of concentrating academic and clinical teaching and medical research around a hospital situated where possible in the university campus. Out of three hundred and sixteen hospitals devoted to medical education forty were owned and controlled and thirty controlled but not owned by the medical schools of universities.

In Vancouver, where the University was in process of being built, it was proposed to put up a medical school and hospital side by side. In Toronto, one of the great medical centres of the world, the General Hospital and the Children's Hospital were right beside the University. The Children's Hospital had a highly efficient scientific staff and a research laboratory staffed by the University. The Toronto School of Hygiene, where "Insulin" had been discovered, had been built at a cost of one million pounds, a large contribution having been received from the Rockefeller Foundation. Undergraduates were instructed in the

institution and the legislature "deeming that it was desirable and expedient to stimulate the prosecution of medical research" had granted a sum of money to establish a Banting and Best Chair of Research.

In New York the most stupendous effort in the history of the medical world had been undertaken by the Columbia University. It had been realized that it was not satisfactory to have the medical school separated from the various hospitals. A huge group of buildings, covering twenty acres of ground and costing four million pounds, was being built to house, not only the medical school, but also the various hospitals. Columbia University was in this way concentrating in one spot all its clinical material and all its medical teachers and research workers. In the Johns Hopkins Medical School the same idea predominated and the wish of the founder "that it was well that all teachers should gather together for the benefit of themselves and the whole of mankind" was being realized. In Rochester there had been built side by side a medical school, a hospital and a research institute, all the buildings being connected by a number of underground subways. The money for the buildings had been provided by a private bequest; for maintenance seven million dollars had been given by the Rockefeller Foundation and five million dollars by Eastman and Company.

In Cleveland the various hospitals, while still retaining their identity, had been induced to sell their valuable sites and were being rebuilt together with a research institute close beside each other on the University campus.

This policy of concentration was being carried out right throughout Canada and the United States of America. Dr. Argyle made a strong appeal for the adoption of a similar policy in Australia. He felt that Australia possessed men of sufficient ability to establish a highly efficient centre of medical education, but that if modern methods were not adopted the status of Australian medical schools must deteriorate.

Dr. Argyle then exhibited a number of interesting cinematograph films, taken by himself and illustrating phases of his visit to America. They were greatly appreciated by those present.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Russell, John Donald, M.B., Ch.M., 1926 (Univ. Sydney), 35, Manning Road, Double Bay.

McStay, Lionel Leslie, M.B., Ch.M., 1926 (Univ. Sydney), Forbes.

Graham, Ian Allister David, M.B., 1925 (Univ. Sydney), Thirroul.

Biggs, Thomas James, M.B., Ch.M., 1926 (Univ. Sydney), Sydney Hospital, Sydney.

Quayle, Athol Frederick, M.B., Ch.M., 1926 (Univ. Sydney), 272, Old Canterbury Road, Summer Hill.

THE undermentioned has been reelected a member of the New South Wales Branch of the British Medical Association:

Rosati, Renzo, M.D., Ch.D., 1093 (Univ. Pisa), Coonamble.

WELCOME TO SIR JOHN GOODWIN.

THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION entertained His Excellency Lieutenant-General Sir John Goodwin, the Governor of Queensland, on June 16, 1927, at Rowe's Banquet Hall, Brisbane. Dr. H. V. Foxton, the President, was in the chair and one hundred and four members of the Branch were present.

Dr. Foxton in proposing the toast of their guest, extended a warm welcome to His Excellency both to the State

of Queensland and also to the ranks of the Queensland Branch of the British Medical Association. He expressed their gratification at Sir John Goodwin's appointment as the representative of the King and emphasized the fact that Sir John was the most distinguished member of their Branch.

In his reply SIR JOHN GOODWIN thanked those present for the very hearty welcome that they had extended to him, both as a fellow medical practitioner and as Governor of Queensland. He was very pleased to be in Queensland and he looked forward to his term of office in that State. But he was especially delighted at the reception he had had from the members. Apart from his official work in Queensland he was still greatly interested as a medical man in medical work generally and in the activities of the British Medical Association in particular. He was proud to be a member of that Association. He intended to support the interests of the medical profession as far as it lay in his power and he promised his most sympathetic help to his medical colleagues in their work as well as his keen interest in the activities of the Queensland Branch of the British Medical Association to which he would have the pleasure and honour of belonging.

A short musical programme was provided by MR. R. A. WISHART, DR. G. THOMPSON and DR. C. DE MONCHAUX.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A MEETING of the Senate of the University of Sydney was held on July 4, 1927.

An offer was received from Mr. Frank Albert of the sum of £100 as a foundation for the establishment of two annual prizes in the Department of Anthropology. The offer was accepted with grateful thanks and the conditions for the award of the prizes adopted as outlined by the donor.

It was decided to accept with grateful thanks gifts of £50 and £5 respectively from Dr. H. R. G. Poate and Miss Killen as contributions to the Department of Anatomy, preferably for carrying out research work.

A letter was received from the proprietors of the *Sydney Morning Herald* covering a cheque for the sum of £10,000 to be applied to the Endowment Fund for the General Purposes of the University. It was resolved to express sincere and grateful thanks to the proprietors of the *Herald* for this magnificent benefaction.

The Registrar reported the receipt of anonymous gifts of £500 and £310 respectively from graduates of the University in connexion with the Seventy-fifth Anniversary Appeal about to be launched. Adequate thanks for their munificent gifts had been extended to the donors.

It was resolved to assent to an agreement with the Commonwealth Council for Scientific and Industrial Research in connexion with the carrying out of investigations on poison plants at the University, the ordinary facilities of the Departments of Chemistry and Pharmacology to be placed at the disposal of the officers of the Council, the Senate agreeing to Professor Kenner, Professor Chapman and Mr. H. Finnemore (Lecturer in Pharmacy) acting on the controlling Committee.

It was resolved to approve of the necessary action being taken to enable the Cancer Research Committee to affiliate with the British Empire Cancer Campaign.

At the request of the Honourable the Prime Minister of the Commonwealth it was decided to approve of Professor Eastaugh acting as Chairman of the recently established Australian Commonwealth Association of Simplified Practice.

The following appointments were confirmed:

Dr. H. R. Seddon as Acting Lecturer in Veterinary Pathology, Bacteriology and Protozoology.

Mr. P. W. Woollettas, Laboratory Assistant to the Cancer Research Committee in the Department of Physiology.

Dr. Elinor S. Hunt as Honorary Research Worker to the Cancer Research Committee in the Biophysical Laboratories.

Professor A. E. Mills was reappointed to the Chair of Medicine for a further period of three years.

The following examiners were appointed in connexion with the Final Degree Examination in Medicine in August:

Medicine: Professor A. E. Mills, Dr. Cecil Purser, Dr. C. G. McDonald.

Clinical Medicine: Dr. C. B. Blackburn, Dr. A. W. Holmes & Court, Dr. E. W. Fairfax, Dr. H. J. Ritchie.

Surgery: Professor F. P. Sandes, Dr. R. B. Wade, Dr. H. S. Stacy.

Clinical Surgery: Dr. G. H. Abbott, Dr. C. E. Corlette, Dr. St. J. W. Dansey, Dr. Archie Aspinall.

Obstetrics: Professor J. C. Windeyer, Dr. S. H. MacCulloch.

Gynaecology: Dr. Reginald Davies, Dr. George Armstrong.

Psychiatry: Professor W. S. Dawson.

Diseases of the Ear, Nose and Throat: Dr. W. C. Mansfield.

Diseases of the Skin: Dr. E. H. Molesworth.

Ophthalmology: Dr. R. G. Waddy.

Diseases of Children: Dr. R. B. Wade, Dr. E. H. M. Stephen.

Clinical Obstetrics: Dr. A. J. Gibson, Dr. Constance D'Arcy.

On the recommendation of the Faculty of Medicine it was resolved to confer the degree of M.D. on Edmund Harold Molesworth, M.B., Ch.M., without further examination for his thesis entitled: "Rodent Ulcer." The examiners reported that the work described in the thesis submitted, and in the accompanying paper on "The Leprosy Problem," was of a high standard. Dr. Molesworth graduated M.B., Ch.M. (Sydney) in 1906.

Dr. S. A. Smith, Dr. Sinclair Gillies, Dr. R. Gordon Craig and Dr. E. H. Molesworth were nominated as delegates to represent the University of Sydney at the Third Imperial Social Hygiene Congress to be held in London in October next.

It was decided that the bequest to the University by the late Dr. O. H. Reddall, of Randwick, should be applied to the foundation of a scholarship to be entitled "The Marion Clare Reddall Scholarship," to be awarded to any graduate or undergraduate in medicine of the University of Sydney for research in any of the subjects of the medical curriculum or in any branch of medical science, the tenure of the scholarship to be for one year, subject to renewal at the discretion of the Senate.

It was decided to establish Fellowships in Obstetrics of the annual value of £250 for a period limited to six years to be awarded to graduates in medicine of the University of Sydney who have evidenced interest and capacity for research in the subject during their undergraduate course and also general fitness to foster the objects of the Fellowship, the tenure of each Fellowship to be for a period of one year, subject to renewal at the discretion of the Senate.

Professor E. R. Holme, O.B.E., M.A., was appointed Director of the appeal for financial assistance about to be launched on occasion of the seventy-fifth anniversary of the University.

Professor Vonwiller, Associate Professor Priestley and Mr. H. Finnemore (Lecturer in Pharmacy) were appointed delegates to represent the University at the nineteenth meeting of the Australasian Association for the Advancement of Science to be held at Hobart in January next.

The Carnegie Endowment for International Peace designated Professor G. H. Blakeslee, Ph.D., L.H.D., Professor of History and International Relations at Clark University, Worcester, Massachusetts, United States of America, to be Visiting Carnegie Professor, International Relations, at the University of Sydney for such part of the year 1927-1928 as should be found to be mutually convenient and agreeable.

Obituary.

WILLIAM FREDERICK TAYLOR.

ON the twenty-ninth of June, 1927, a long, important and honourable career came to its close. William Frederick Taylor held it to be the duty and the privilege of every medical practitioner to relieve pain and to diminish suffering and he himself continued to alleviate and help for a period of sixty-seven years to within a week of his death. He occupied a very prominent place in the community and exerted a highly beneficial influence on his generation.

William Frederick Taylor was born in London in the year 1840. When two years of age he was taken by his parents to Canada. Of his youth we have no record, but it is certain that the foundation of his subsequent achievements must have been laid early. He entered the Queen's University at Kingston and at the young age of twenty-one he secured the degree of doctor of medicine. In 1861 he was in London, where he passed the examination for the licentiate of the Society of Apothecaries of London, probably to enable him to be registered in the United Kingdom. He then migrated to Australia and practised his profession in Victoria and New South Wales for a period of about three years. In 1866 he returned to London and studied for a year at Guy's Hospital. He sat for the examination for the membership of the Royal College of Surgeons of England and had no difficulty in passing it. He recognized that the best post-graduate study was to work at various schools in foreign countries and he therefore seized the opportunity to visit Paris before returning to Australia and to acquaint himself with the methods of practice of the physicians and surgeons of the chief hospitals in that city.

In 1868 he was again in Australia and again he selected the State of Victoria. He secured the appointment of Resident Medical Superintendent at the Beechworth Hospital. After having served his term he practised for a time at Eaglehawk, near Bendigo. He acted as visiting medical officer at the Sandhurst Hospital and later as Medical Superintendent at the Peak Downs Hospital. In 1870 he went to Clermont in Queensland and a few years later he moved to Warwick. Ten years of roving seem to have satisfied his craving for new pastures, at all events for a time. During these ten years he had accumulated knowledge, experience and an understanding of human nature. His successful practice in Warwick was built up on the safe basis of a liberal scholastic and medical education, an intense love for his fellow men and a keen sense of duty. In those days

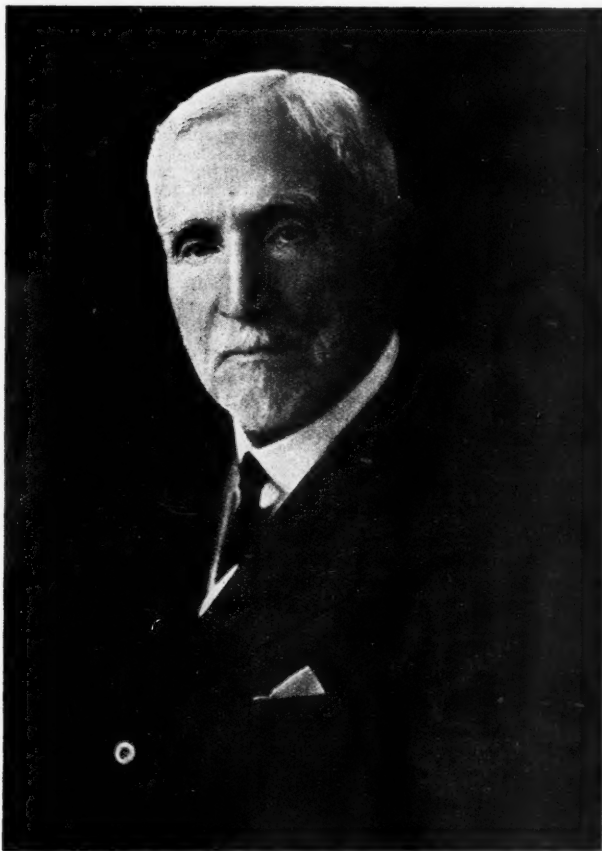
Warwick was a small place, but the neighbourhood held a sufficient number of persons to keep him busy. He gained an immense popularity. Everyone trusted him and regarded him with respect and affection. In 1883 he yielded to the call for a wider field for his activities and after having sold his practice, he took up his residence in Brisbane. He stayed long enough to form an opinion as to his future practice and then voyaged for a third time to England, partly to widen his professional knowledge and partly to refresh himself for another spell of hard work. While in London he secured the diploma of public health of the Royal College of Surgeons and at the same time he became a Fellow of the Royal Sanitary Institute. About this time he added to his versatility by acquiring special knowledge and skill as an ophthalmic surgeon and as a throat surgeon. He soon gained the recognition of his colleagues and of the public as a practitioner of unusual ability.

For many years he was Honorary Surgeon to the Eye, Ear and Throat Department of the Brisbane Hospital. In later years he devoted an increasing amount of attention to ophthalmic work. Even after he attained the age of eighty years he conducted a large ophthalmic practice with signal success. At a considerably earlier date he undertook work of a totally different nature and acquitted himself admirably in a new rôle. He served as Medical Officer of Health for the City of Brisbane. His work in this capacity was responsible for his enthusiasm as a legislator in pressing the maintenance of the public health into the foreground.

In the 'eighties he took a prominent part of the work of the Queensland Medical Society and in 1891 he was elected President. Three years later the Queensland Branch of the British Medical Association was formed and recognized; William Frederick Taylor was one of the first to advocate this move and he was the first to be elected President. His keenness, his sound judgement and his persistence in setting a high ideal and in maintaining it led him to

the chair on three separate occasions, a unique honour. He was president of the Branch in 1899 for the second time and in 1901 for the third. He was also chosen to sit as a member of the Queensland Medical Board. In this connexion he realized the limitations of the powers of the Board under the *Medical Act* of 1867, a measure that was retained on the statute book long after it had served its purpose. William Frederick Taylor served his profession and the community in an extraordinary manner as a member of the Board.

Outside the sphere of medicine he attained high positions. He was a prominent member of the Royal Geographical Society and of the Royal Society of Queensland and was elected President of both bodies in the course of time. Many years ago he was appointed a Member of



the Legislative Council. He was not a brilliant speaker, but his utterances were always measured and balanced. His eminent qualifications as a legislator and counsellor became recognized throughout both parties. His usefulness in the Upper House cannot be better illustrated than by reference to a bill introduced by him for the proscription of indecent advertisements. His exposure of the vile traffic and of its extent and his advocacy of a moral purge convinced everyone in the Legislative Council. At first the bill did not find favour in the Assembly, but thanks to his persistent and eloquent instruction he persuaded the members individually with the result that an abominable practice was eradicated.

In 1914 the members of the medical profession of Queensland invited the Australasian Medical Congress to hold its tenth session in Brisbane in 1917. The invitation was accepted and William Frederick Taylor was elected President. The outbreak of war rendered it impossible to organize a session in 1917. Years passed during the whole course of which the continuity of Congress hung on the slender thread of the life of this energetic man of more than seventy years.

In 1918 it was determined to hold the Congress in August of 1920 and the necessary executive committee was appointed. His energy and initiative in the work of preparation were amazing, seeing that he was already in his eightieth year. The undoubted success of the session was in large part due to his guidance and his remarkable influence. It was the last of the Congresses under the old *régime* and for that reason among others the occasion was historic. William Frederick Taylor stands out as a picturesque and imposing figure in the achievement. From his lengthy address his manifold interests and the unassailable character of the man can be recognized. And beside him stood a gentle, kindly lady, she who had shared his joys and trials since the early days in Clermont.

William Frederick Taylor was a man of irreproachable honour and integrity. He held his opinions strongly and fought hard for right. He was tolerant and patient; a man with whom it was difficult to quarrel, for he was always ready to acknowledge an effort aimed at the benefit of humanity. He reformed others by the persistence of his arguments and by the force of his sincerity. In private he was the most admirable of men; in his practice he was an ideal adviser and friend.

His record is one to be proud of. A long life spent in useful service to his fellow man must cast its influence long after the memories of the man himself have begun to fade. And it will be long ere his contemporaries will forget the kindly doctor who scorned ease and leisure even in his old age that others might be spared from pain.

JAMES BOOTH CLARKSON.

It is with regret that we announce the death of Dr. J. Booth Clarkson, which occurred at Brisbane on July 18, 1927.

ACLAND ANDERSON O'HARA.

We regret to announce the death of Dr. Acland Anderson O'Hara, which occurred at Sydney on July 17, 1927.

BRYDEN GLENDINING.

NEW ZEALAND practitioners will learn with regret of the death of Dr. Bryden Glendining, a native of Dunedin, on May 19, 1927. Dr. Glendining worked for three years as Research Scholar at the Cancer Laboratories, Middlesex Hospital, and published some valuable papers on malignant disease of the female organs of generation. He was for a time Pathologist at the Chelsea Hospital for Women. His death occurred in Bedfordshire.

Correspondence.

PELVIC ABSCESS.

SIR: Dr. Trumble's article on pelvic abscess (July 2) I read with particular interest. I have not seen a case of pelvic abscess pointing at the rectum for some considerable time, but in the early years of this century I found these cases of common occurrence, especially in connexion with cases of appendicitis. This was in the days when cases of stomach ache were regarded lightly by lay people and when it was our practice to treat the less severe cases of appendicitis medically.

I soon came to welcome in such cases the development of a pelvic abscess pointing in the rectum, because of the simplicity of its treatment and the good result that followed.

The passage of frequent small motions consisting mostly of mucus, was the predominant symptom as a rule and quite often there was little disturbance of temperature and pulse.

The abscess was opened under an anæsthetic as soon as the rectal swelling came within easy reach, by simply retracting with a small Sim's speculum the posterior wall of the rectum, grasping the summit of the exposed swelling with a volsellum, incising the mucous membrane below this and then confidently introducing into the abscess a sinus forceps. The opening was then enlarged sufficiently to admit a finger.

My experience was that in a day or two a reaccumulation usually occurred, as often happens with a peritonissilar abscess after it is opened. It was a simple matter then

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to pass the finger and forcibly reopen the track into the abscess cavity again evacuating the pus, after which there was no further trouble.

Dr. Trumble refers to the possibility of rupturing the abscess during these manipulations. I can record an instance of this kind.

Some ten years ago I was called to see an elderly spinster some way out in the country. She had been ill with abdominal symptoms for some days and there was evident pelvic peritonitis. I had the patient brought into hospital and as soon as she was got to bed I made a rectal examination, finding a pelvic abscess pointing. Whilst palpating the tense swelling the tension suddenly disappeared—a most unpleasant sensation, indicating rupture of the abscess. My manipulations had been gentle and I can only conclude that the rough journey to the hospital had partially ruptured the adhesions localizing the abscess and the rectal examination completed it.

Within two hours the abdomen was opened and a diligent search made for the original focus without success. The appendix and tubes were not guilty and I am inclined to think that a diverticulum may have been the cause of the abscess. Anyhow the search helped to disseminate the infection and broke down adhesions opening up areas of absorption. Then every attempt was made to cause the bowels to "wriggle" by means of purgatives, pituitrin *et cetera*. Morphine was of course most conscientiously withheld. Painful hypodermic salines were repeatedly administered and after ten days of distressing and painful illness the patient died, acutely conscious of everything, including no doubt my own anxiety at every visit which I am sure I was unable to conceal. What barbarous treatment!

Nowadays what should one do in such a case? Give an immediate dose of morphine and keep the patient under the influence of it till the end of the acute illness whatever the result, employ Fowler's position, drain the pelvis in the most expeditious manner possible *per rectum* or *per vaginam* or through a small suprapubic wound. The latter could be done with local anaesthesia and without raising the pelvis. Give nothing by mouth except water and this only in the absence of repeated vomiting and administer saline as required.

This treatment is based on sound principles, is easy for the patient, nurses and doctor and will most likely effect a cure.

Yours, etc.,

W. R. GROVES, M.D.

Kyneton, Victoria,
July 4, 1927.

URTICARIA PIGMENTOSA.

SIR: I wish to refer to a paper which appeared in THE MEDICAL JOURNAL OF AUSTRALIA of June 4, 1927, by Dr. Colquhoun on *urticaria pigmentosa* in adults. I believe that I was one of the first to call attention to the fact that a disease simulating *urticaria pigmentosa* of infancy occurred in adults.

At the *Congresso Internazionale di Dermatologia e Sifilografia, Roma, 1912*, I exhibited a *moulage*, representing the macular eruption on the arm, of one of my patients with this affection. Several dermatologists, including the late Sir Malcolm Morris, were interested in this *moulage*, but of course the dermographic sign so important in the diagnosis of this condition could not be demonstrated.

What first drew my attention to the similarity of these conditions *urticaria pigmentosa*, infantile and adult forms, was the similar results obtained when I examined the lesions by dermameotrophism (*vide* Dorland's "Medical Dictionary," 1918).

I found that if a macular lesion of the type first appearing in adult life be stroked with a pen handle, a raised white line is developed similar to that appearing in the macular lesions of *urticaria pigmentosa* of children.

I have found this turgescient sign of value for prognostic as well as diagnostic purposes in the consideration of these diseases. I agree with Dr. Colquhoun that this disease in adults is not such an uncommon one as is generally supposed and that owing to the absence of troublesome

symptoms, many persons affected with this disease do not seek treatment.

However quite recently Dr. G. C. Crowley (Melbourne) brought under my notice a patient with *urticaria pigmentosa*, adult form, in which the pruritus was so troublesome and rebellious to the usual antipruritic remedies that I recommended alternate treatments with X rays and ultra-violet light, which method of treatment I have found successful in many cases of severe pruritus. According to my experience in Melbourne *urticaria pigmentosa*, infantile form, is a very rare disease; I have had only six cases which would give a ratio of about 1 in 8,000 for my hospital and private cases.

Another interesting point in Dr. Crowley's case is that the patient was fifty years of age when the condition first appeared and that the eruption has now been present for fifteen years.

Yours, etc.,

HERMAN LAWRENCE, M.R.C.P. (Edin.),
Honorary Consulting Dermatologist, Saint Vincent's
and Queen Victoria Hospitals, Melbourne.
63, Collins Street, Melbourne.

July 15, 1927.

SURGEONS.

SIR: *Re* articles on surgeons, both in the journal and in the lay press of various places:

Why all this propaganda? One feels inclined to congratulate the leading physicians of Australasia, who show up so well in contrast to their surgical brethren in *esprit de corps* and one might add medical etiquette.

The old wolf tries to make up for the failure of natural powers by cunning. If Australasia, with its small population, wants a college of surgeons, why not have it without unsavoury preliminaries. Fellows taught from Australasian surgical textbooks, written by the founders of the college, F.R.C.S., of the old world do not always figure in honorary hospital staffs. Other influences seem to count according to the forces that sway the governing powers of the hospital. Then how is the status of the new college to compare with that of the older colleges. More confusion for the lay mind. If the object is more and better surgeons for the community and less expensive surgery, fewer, not more, barriers for experience in actual surgery are needed, greater facilities for the young graduate to perform operations himself at the charitable hospitals. If new graduates have to undertake operations in isolated places on the general population with few facilities, why not in the great general hospitals? The added experience would make them better surgeons with benefit to that great middle class population that cannot afford the most expensive surgeons, but do not care to take advantage of public charity.

This might solve the problem, hospital abuse and ease the taxpayers of some of the upkeep of these bloated institutions.

Yours, etc.,

"SANGRADO."

June 17, 1927.

THE SAND FLY PEST.

SIR: Considerable discomfort and annoyance is experienced periodically in this district through this pest.

I have tried numerous applications, but apart from temporary relief from cooling lotions nothing has proved of much value, the large urticarial wheals remaining for several days.

I would be grateful if any member could inform me of a remedy which has proved efficacious.

Yours, etc.,

A. A. HILL, M.B., B.S. (Melb.).

Carnarvon, Western Australia.
July 9, 1927.

Books Received.

- SOCIAL FACTORS IN MEDICAL PROGRESS**, by Bernhard J. Stern, Ph.D.; 1927. New York: Columbia University Press. Royal 8vo., pp. 136. Price: \$2.25 net.
- THE NORMAL CHEST OF THE ADULT AND THE CHILD, INCLUDING APPLIED ANATOMY, APPLIED PHYSIOLOGY, X-RAY AND PHYSICAL FINDINGS**, by J. A. Meyers, in collaboration with various writers; 1927. Baltimore: The Williams and Wilkins Company. Royal 8vo., pp. 434, with illustrations. Price: \$5.00 net.
- TEXTBOOK ON DISEASES OF THE SKIN AND SYPHILIS DESIGNED FOR THE USE OF STUDENTS AND PRACTITIONERS**, by Albert Strickler, M.D.; 1927. Philadelphia: F. A. Davis Company. Royal 8vo., pp. 710, with illustrations. Price: \$8.00 net.
- THE NEW MEDICAL FOLLIES**, by Morris Fishbein, M.D.; 1927. New York: Boni and Liveright; Sydney: Angus and Robertson, Limited. Post 8vo., pp. 235. Price: 9s. net.
- THE REVOLT OF MODERN YOUTH**, by Judge Ben B. Lindsey and Wainwright Evans; 1925. New York: Boni and Liveright; Sydney: Angus and Robertson, Limited. Demy 8vo., pp. 364. Price: 12s. 6d. net.
- THE MAGIC OF HERBS: A MODERN BOOK OF SECRETS**, by Mrs. C. F. Leyel; 1926. London: Jonathan Cape; Sydney: Angus and Robertson, Limited. Royal 8vo., pp. 320. Price: 12s. 6d. net.

Diary for the Month.

- Aug. 2.—Tasmanian Branch, B.M.A.: Council.
 Aug. 3.—Victorian Branch, B.M.A.: Branch.
 Aug. 3.—Western Australian Branch, B.M.A.: Council.
 Aug. 5.—Queensland Branch, B.M.A.: Branch.
 Aug. 9.—Tasmanian Branch, B.M.A.: Branch.
 Aug. 9.—New South Wales Branch, B.M.A.: Ethics Committee.
 Aug. 10.—Central Northern Medical Association, New South Wales.
 Aug. 11.—South Australian Branch, B.M.A.: Council.
 Aug. 11.—Victorian Branch, B.M.A.: Council.
 Aug. 11.—New South Wales Branch, B.M.A.: Clinical Meeting.
 Aug. 12.—Queensland Branch, B.M.A.: Council.
 Aug. 15.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 Aug. 16.—Tasmanian Branch, B.M.A.: Council.
 Aug. 16.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 Aug. 17.—Western Australian Branch, B.M.A.: Branch.
 Aug. 18.—Section of Medical Literature and History, New South Wales Branch, B.M.A.

Medical Appointments.

Dr. Edward William Buckley (B.M.A.) has been appointed Visiting Surgeon to Tamworth Gaol, New South Wales.

Dr. William Thomas Dermer (B.M.A.) has been appointed Medical Inspector of Seamen at Port Hedland, Western Australia.

Dr. Rupert Eric Magarey (B.M.A.) has been appointed Honorary Gynaecologist to the Adelaide Hospital, Adelaide, South Australia.

Dr. A. P. Davis (B.M.A.) has been appointed Acting Resident Magistrate and Magistrate of the Local Court, Port Hedland, Western Australia.

Dr. Jacob Jona (B.M.A.) has been appointed Certifying Medical Practitioner and Medical Referee at Melbourne, under the provisions of the Workers' Compensation Acts.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xxii.

COMMONWEALTH DEPARTMENT OF HEALTH, PORT ADELAIDE:
 Medical Officer.
 MELBOURNE HOSPITAL: Honorary Physician to Out-Patients.
 SYDNEY HOSPITAL: Clinical Assistant.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
NEW SOUTH WALES: Honorary Secretary, 39 - 34, Elizabeth Street, Sydney.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Hon- orary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

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